AD A118246

NPS67-82-003CR

# NAVAL POSTGRADUATE SCHOOL

## Monterey, California

DTIC
ELE
AUG 16 1982
S
H

CONTRACTOR REPORT

# SHARP NOSE LENS DESIGN USING REFRACTIVE INDEX GRADIENT

ODED AMICHAI

JUNE 1982

Approved for public release; distribution unlimited

Prepared for:
Naval Postgraduate School
Monterey, California 93940

Copy available to DTIC does not permit fully legible reproduction

DTIC FILE COPY

82 08 16 162

NAVAL POSTGRADUATE SCHOOL
Monterey, California

Rear Admiral J. J. Ekelund
Superintendent

D. A. Schrady
Acting Provost

The work reported herein was carried out for the Naval Postgraduate School by Dr. Oded Amichai under Contract Number N00228-81-C-H231. The work presented in this report is in support of the DARPA/AIFS project. The work is a continuation of earlier research efforts by several thesis students. An age-old problem is the conflict between optical quality and aerodynamic performance for infrared domes. The research may provide a means to circumvent the problem through use of gradient refractive index. The project on Navy Applications of AIFS is funded by Defense Advanced Research Projects Agency and is under the cognizance of Professor A. E. Fuhs.

Reproduction of all or part of this report is authorized.

This report was prepared by:

DR. ODED AMICHAI
Contracted Research Associate

Reviewed by:

ALLEN E. FUHS
Distinguished Professor

DANIEL J. COLLINS
Acting Chairman
Department of Aeronautics

Released by:

W. M. TOLLES
Dean of Research

# DISCLAIMER NOTICE

THIS DOCUMENT IS BEST QUALITY PRACTICABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.

UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

| RMS REPORT DOCUMENTATION PAGE | | READ INSTRUCTIONS BEFORE COMPLETING FORM |
|---|---|---|
| 1. REPORT NUMBER<br>NPS67-82-003CR | 2. GOVT ACCESSION NO.<br>AD-A118246 | 3. RECIPIENT'S CATALOG NUMBER |
| 4. TITLE (and Subtitle)<br>SHARP NOSE LENS DESIGN USING REFRACTIVE INDEX GRADIENT | | 5. TYPE OF REPORT & PERIOD COVERED<br>Contractor Report<br>6. PERFORMING ORG. REPORT NUMBER |
| 7. AUTHOR(s)<br>Oded Amichai | | 8. CONTRACT OR GRANT NUMBER(s)<br>N00228-81-C-H231 |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>Naval Postgraduate School<br>Monterey, California 93940 | | 10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS<br>DARPA ORDER 4035<br>ELEMENT: 62702E |
| 11. CONTROLLING OFFICE NAME AND ADDRESS<br>Defense Advanced REsearch Projects Agency<br>1400 Wilson Boulevard<br>Arlington, Viringia 22209 | | 12. REPORT DATE<br>June 1982<br>13. NUMBER OF PAGES<br>287 |
| 14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office) | | 15. SECURITY CLASS. (of this report)<br>UNCLASSIFIED<br>15a. DECLASSIFICATION/DOWNGRADING SCHEDULE |

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

DTIC ELECTE AUG 16 1982 H

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Guided projectiles
precision guided munitions
guns
gun launched ramjet
sensors
missile optics
infrared optics

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

For infrared sensors located at the nose of a missile or a projectile, an age-old problem occurs. A conflict between optical quality and aerodynamic drag exists. A new approach for solving this problem is being developed using gradient refractive index, GRIN, for lens design. The equations for lens design incorporating GRIN are formulated for the special case of spherically symmetrical GRIN. A computer code for

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE
S/N 0102-LF-014-6601

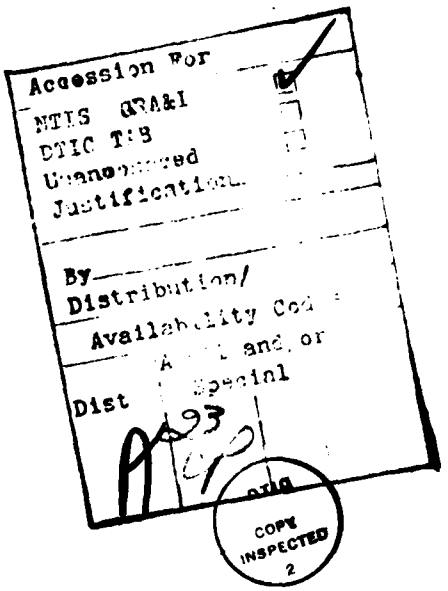


UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

20. ABSTRACT CONTINUED:
designing a GRIN lens and for determining aberrations has been developed. A different program (LENS) calculates lens design and lens performance for the case of homogeneous refractive index. Results of this program provide a check on the more complex program which includes GRIN. The computed program calculates the spot diagram for both meridianal and skew rays. The spot diagram, which is the intersection of rays with the focal plane, is plotted, and the $\sigma_{rms}$ and centroid location of the spot diagram are calculated. Also a cumulative energy diagram is obtained from the program. The computer code has been organized to calculate the items enumerated above for either a circular cone for the inside or outside surface of the pointed lens. For homogeneous refractive index, both cases are included in the program discussed in this report. However, for the GRIN case, only the complete program for a lens with a conical surface on the outside is reported here. The alternate case is being developed by a thesis student.

Features of the computer program include the following: use of many subroutines for clarity and for easy modification, and use of program structure for easy integration into an optimization code.

Sample lens designs and lens performance are presented. The computer code provides the tools for lens design. Considerable additional work is needed for selecting the best lens design.



## ABSTRACT

For infrared sensors located at the nose of a missile or a projectile, an age-old problem occurs. A conflict between optical quality and aerodynamic drag exists. A new approach for solving this problem is being developed using gradient refractive index, GRIN, for lens design. The equations for lens design incorporating GRIN are formulated for the special case of spherically symmetrical GRIN. A computer code for designing a GRIN lens and for determining aberrations has been developed. A different program (LENS) calculates lens design and lens performance for the case of homogeneous refractive index. Results of this program provide a check on the more complex program which includes GRIN. The computed program calculates the spot diagram for both meridianal and skew rays. The spot diagram, which is the intersection of rays with the focal plane, is plotted, and the $\sigma_{rms}$ and centroid location of the spot diagram are calculated. Also a cumulative energy diagram is obtained from the program. The computer code has been organized to calculate the items enumerated above for either a circular cone for the inside or outside surface of the pointed lens. For homogeneous refractive index, both cases are included in the program discussed in this report. However, for the GRIN case, only the complete program for a lens with a conical surface on the outside is reported here. The alternate case is being developed by a thesis student.

Features of the computer program include the following: use of many subroutines for clarity and for easy modification, and use of program structure for easy integration into an optimization code.

Sample lens designs and lens performance are presented. The computer code provides the tools for lens design. Considerable additional work is needed for selecting the best lens design.

## ACKNOWLEDGMENT

The author wishes to acknowledge the valuable help and cooperation that Professor Allen E. Fuhs has given him throughout this work. Also, Captain H. Carr during the performance of his thesis work, has been instrumental in stimulating this effort.

TABLE OF CONTENTS


1. INTRODUCTION . . . . . 1

2. BRIEF OVERVIEW OF PROBLEM FORMULATION . . . . . 2

3. EQUATIONS FOR THE HOMOGENEOUS CASE . . . . . 6

3.1 Meridian Plane. . . . . 6

3.2 Skew Rays in the Homogeneous Case . . . . . 12

4. FORMULATION OF EQUATIONS FOR GRIN LENS DESIGN . . . . . 24

4.1 Solving the Integral for $\theta_e$ . . . . . 24

4.2 Meridian Plane . . . . . 25

4.3 Skew Rays . . . . . 33

5. FLOW CHART OF PROGRAM LENS . . . . . 44

6. FLOW CHART OF PROGRAM GRIN . . . . . 88

7. COMPUTER PROGRAMS USER'S GUIDE . . . . . 111

7.1 Input Data . . . . . 111

7.2 Options . . . . . 111

7.3 Execution Commands . . . . . 111

8. COMPUTER PROGRAMS LIST OF SYMBOLS . . . . . 113

8.1 Subroutines . . . . . 113

8.2 Program Symbols . . . . . 114

9. PROGRAM LENS - LISTING . . . . . 116

10. PROGRAM GRIN - LISTING . . . . . 138

11. PRELIMINARY RESULTS . . . . . 158

12. SUMMARY OF THE REPORT . . . . . 283

REFERENCES . . . . . 285

## *LIST OF FIGURES*


1. Geometry for Ray Tracing in a Spherically Symmetrical GRIN Medium . . . . . 4

2. Diagram Illustrating the Shape of the Front and Rear Surface of a GRIN Lens . . . . . 7

3. Geometry and Angle Definitions for the Homogeneous Refractive Index Case . . . . . 8

4. Diagram Showing Coordinate Transformation for Off-axis Rays. . . . . 14

5. Cross Section of Lens in a Plane Normal to the Lens Axis. 16

6. Diagram Used to Calculate the Direction Cosines of Skew Rays at the Rear Surface . . . . . 19

7. Geometry of a Truncated Cone Which Represents a Small Portion of the Rear Surface of the Lens . . . . . 20

8. Diagram Defining Angles and Coordinates for a Ray Transmitted by the GRIN Lens . . . . . 27

9. Illustration of the Lens Which has a Circular Cone on the Inside Surface . . . . . 45

# 1. INTRODUCTION

A long-term conflict exists between optics and aerodynamics for missile nose design. Optics requires a blunt shaped nose similar to that used on the Sidewinder missile. Favorable aerodynamics for supersonic missiles requires a sharp nose which permits an attached shock wave. For rocket powered missiles or projectiles, the sensor and associated optics occupies the complete nose area. The penalty of a blunt nose is high drag. For ramjet propelled missiles or projectiles, the penalty of a blunt nose is poor pressure recovery by the inlet; this statement assumes a nose inlet is used.

In times past, the lens designer had available three design parameters; a satisfactory lens in the general shape of a cone has not been designed. A lens can be designed using homogeneous refractive index which focuses rays; however, off-axis rays have very large aberrations. The thesis by Terrell [1] discusses the design of a conical lens.

A fourth design parameter has become available which is spatially variable refractive index. The associated technology is known as GRIN; see references [2-13]. GRIN is short notation for Gradient Refractive Index. The thesis by Frazier [14] briefly introduced the use of GRIN in lens design; likewise the thesis of Terrell [1] has a brief discussion. The thesis of Carr [15] will have more extensive results.

The development of materials which have variable refractive index has been motivated by optical fiber technology. Optical fibers can propagate a single mode with low losses if an ap-

propriate spatial variation of refractive index exists. Based on the information in reference [2] , the maximum variation of GRIN is limited to a few percent. The report contains twelve sections. In section 3 the problem of the homogeneous case is solved (program LENS) while the GRIN lens design is formulated in section 4 (program GRIN). The flow charts to the computer programs are given in section 5 and 6, and a user's guide to each of the programs is illustrated in section 7. The programs are listed in sections 9 and 10.

## 2. BRIEF OVERVIEW OF PROBLEM FORMULATION

Define the axial distance as $x$ and radial distance as $r$ in a cylindrical coordinate system. The lens is to be axisymmetric so that angle is not a variable.

In general the shape of the front surface, is a function of $r$

$$x = F_f(r) \tag{2.1}$$

where subscript $f$ denotes front surface. Likewise the rear surface is a function of $r$

$$x = F_r(r) \tag{2.2}$$

where subscript $r$ indicates the rear surface.

As a simplification, either the front or rear surface is a circular cone. Terrell [1] treated the case of a conical front surface; Carr [15] is investigating the case of a conical rear surface. This report develops a computer code which calculates either case. A single consistent computer program is used for both cases; this fact is important for application

of optimization codes.

In general, the GRIN can be specified as

$$n = F(x,r) \tag{2.3}$$

The function F involves both spatial variables. However, a less complex GRIN is used which is spherically symmetrical refractive index. In this case

$$n = n(x_c,r') \tag{2.4}$$

where r' is radial distance from the center of symmetry for the sphere. The location of the center of the spherical GRIN is on the lens axis at axial position $x_c$.

One very important computational advantage of spherical GRIN is that the rays within the lens are confined to a single plane. In the case of skew rays, the plane of the rays is not a meridianal plane of the lens.

The equation for a ray trajectory in a spherically symmetric GRIN geometry is

$$\theta_e = \theta_0 + E\int \frac{dr'}{r'\sqrt{r'^2n^2(r')-E^2}} \tag{2.5}$$

where E is a constant for a ray. The value of E is obtained from

$$E = \epsilon n_0(r_0')r_0'\sin\Psi_0 \tag{2.6}$$

Define $\vec{r}'$ as a unit vector in the direction of a line extending from $x_c$ to point P in Figure 1. Define $\vec{R}$ as a unit vector of a ray which has been refracted by the surface at point P. The angle $\Psi_0$ is obtained from

$$\cos \Psi_0 = \vec{r}_0' \cdot \vec{R} \qquad (2.7)$$

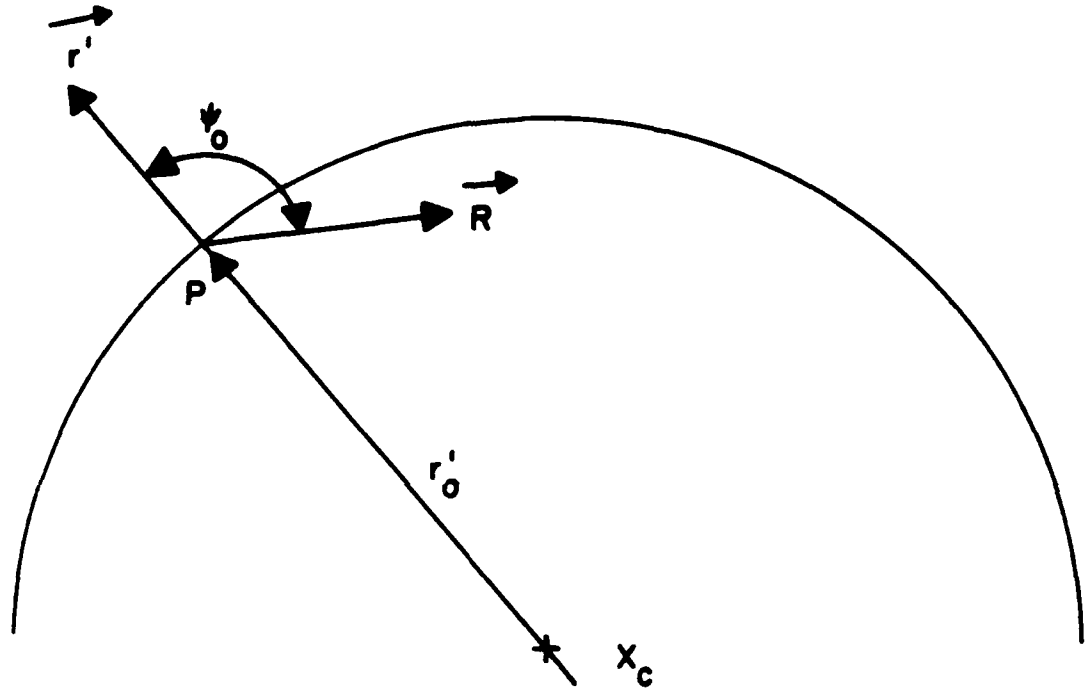



Figure 1. Geometry for Ray Tracing in a Spherically Symmetrical GRIN medium. The ray vector, $\vec{R}$ , and the radius vector, $\vec{r}'$ , are illustrated.

In equation (2.6), the $\varepsilon$ is a sign function having a value of + 1.0 or - 1.0 depending on the value of $\Psi$ within the lens.

$$\varepsilon = \begin{cases} + 1.0 & \Psi \leq \pi/2 \\ - 1.0 & \Psi > \pi/2 \end{cases} \tag{2.8}$$

Equation (2.5) can be integrated for certain functions n(r'). One function is

$$n(r') = \left[ A + B(r'/r_0)^2 \right]^{\frac{1}{2}} \tag{2.9}$$

where A and B are constants. $r_0$ is a value associated with a specific lens design; a convenient value for $r_0$ is that value for the ray defining the lens aperture.

Combining equations (2.5) and (2.9) and completing the integration yields

$$\theta_e(r') = -\tfrac{1}{2} \left[ \sin^{-1} \left\{ \frac{2E^2/r_r'^2 - A}{(A^2+4BE^2/r_0^2)^{\frac{1}{2}}} \right\} - \sin^{-1} \left\{ \frac{2E^2/r_f'^2 - A}{(A^2+4BE^2/r_0^2)^{\frac{1}{2}}} \right\} \right] \tag{2.10}$$

Equation (2.10) is an explicit relation for $\theta_e$ as a function of r'. $r_r$, $r_f$ are the radii to the rear surface and to the front surface respectively. An explicit relation for r' as a function of $\theta_e$ can be derived; the result is

$$r'_{(r,f)}(\theta_e) = \frac{\sqrt{2}\,|E|}{\left( A + \sqrt{A^2+4BE^2/r_0^2} \cdot \sin \left\{ \mp 2\theta_e + \sin^{-1} \left[ \frac{2E^2/r_{(r,f)} - A}{\sqrt{A^2+4BE^2/r_0^2}} \right] \right\} \right)^{\frac{1}{2}}} \tag{2.11}$$

For details look at section 4.1. For certain phases of the calculation equation (2.11) is needed.

Thinking ahead to numerical optimization, the function of equation (2.9) was chosen to avoid numerical integration of equation (2.5). Equation (2.5) must be evaluated several times for each ray. A lens design may involve 100 to 1000 rays. Numerical optimization of the lens requires calculation of many different lens shapes. Hence, evaluation of equation (2.5) may occur several thousand times in the process of lens optimization. The GRIN-related parameters to be determined in optimization are A, B and $x_c$.

## 3. EQUATIONS FOR THE HOMOGENEOUS CASE

### 3.1 Meridian Plane

The homogeneous case is included here for several reasons. First, the homogeneous case is a simple example in which the intricacies of lens design are apparent in considerable clarity. Iteration is not required for design of a lens with a homogeneous refractive index, whereas for GRIN, iteration is necessary. Second, the homogeneous case provides a meaningful check of the GRIN program. To conduct the check, the value of B is zero in equation (2.9). Obviously the answers from GRIN program with B equal to zero must agree with answers from the homogeneous case.

The book by Kingslake [16] has been helpful in the program development.

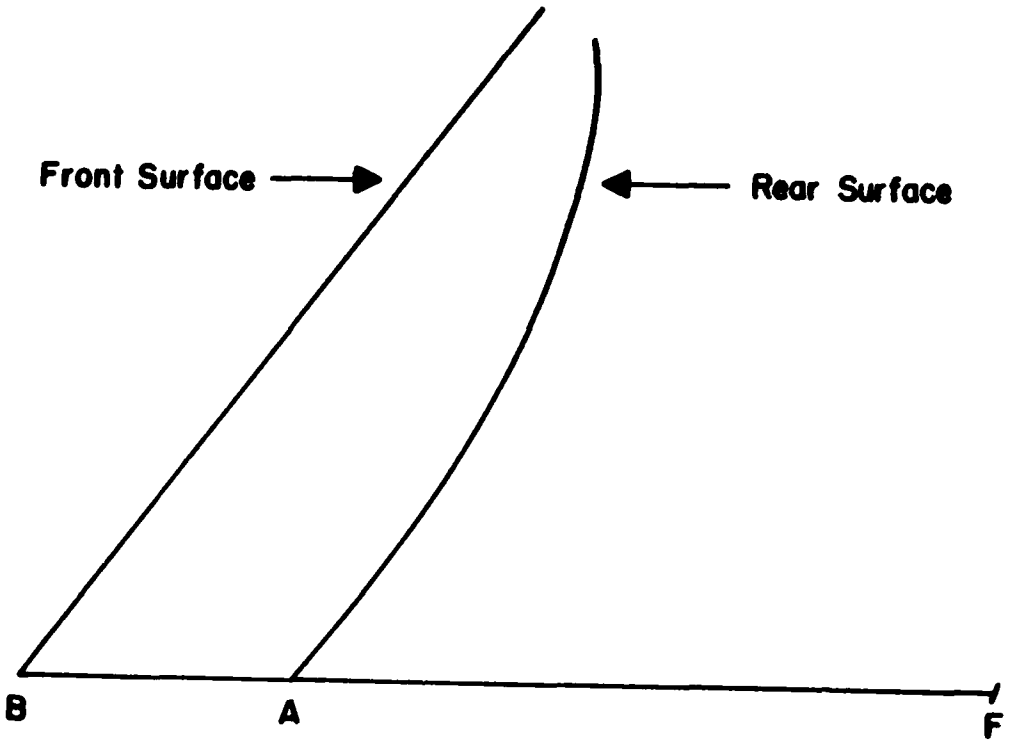



Figure 2. Diagram illustrating the shape of the front and rear surfaces of a GRIN lens. BAF is axis of symmetry. F is the focal point.

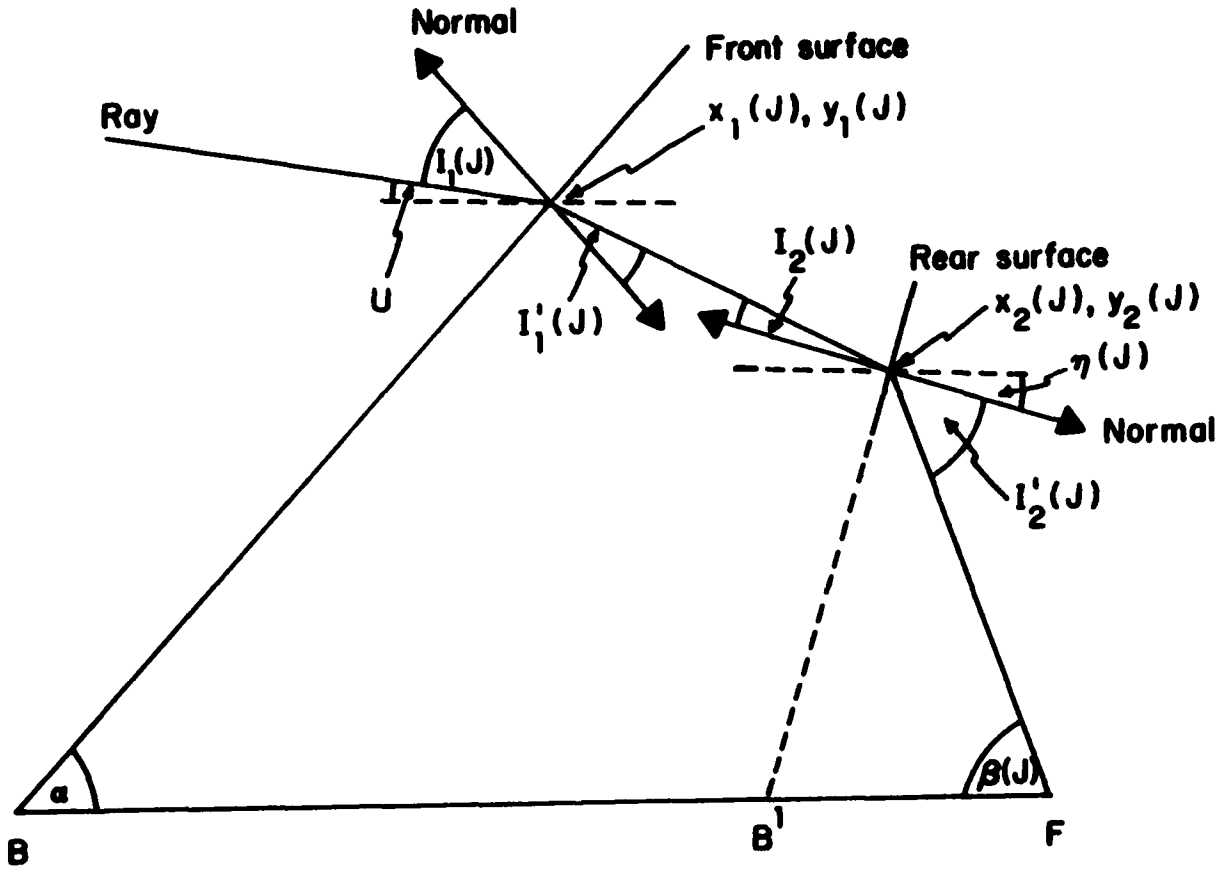



Figure 3. Geometry and angle definitions for the homogeneous refractive index case.

### 3.1.1 The Equations

Refer to Figure 3 for definition of the symbols.

$$\eta(J) + I_2'(J) = \beta(I) \tag{3.1}$$

$$\sin(I_2[J]) = n_{32} \cdot \sin(I_2'[J]) \tag{3.2}$$

The notation $n_{32}$ is used for the ratio $n_3/n_2$.

$$I_1'(J) = (\pi/2-\alpha) - (\eta(J) + I_1(J)) \tag{3.3}$$

$$\sin(I_1[J]) = n_{21} \cdot \sin(I_1'[J]) \tag{3.4}$$

$$\alpha + I_1(J) + U = \pi/2 \tag{3.5}$$

### 3.1.2 Solution

The angles $\alpha$, $\beta(J)$ are inputs and are known.

From eq. (3.5):

$$I_1(J) = \pi/2 - \alpha - U \tag{3.5.1}$$

From eq. (3.4):

$$I_1'(J) = \sin^{-1}[n_{12} \cdot \sin(I_1[J])] \tag{3.4.1}$$

Substitute eq. (3.5) to eq. (3.3):

$$\eta(J) + I_2(J) = I_1(J) - I_1'(J) + U \tag{3.3.1}$$

But from eq. (3.2):

$$I_2'(J) = \sin^{-1}[n_{32} \cdot \sin(I_2[J])] \tag{3.2.1}$$

From eq. (3.3.1):

$$I_2(J) = [I_1(J) - I_1'(J)] - \eta(J) - U \tag{3.3.2}$$

Substitute eq. (3.3.2) into eq. (3.2.1):

$$I_2'(J) = \sin^{-1}[n_{23} \cdot \sin\{I_1(J) - I_1'(J) - \eta(J) + U\}] \tag{3.2.2}$$

Substitute eq. (3.2.2) into eq. (3.1):

$$\eta(J) + \sin^{-1}[n_{23} \cdot \sin\{I_1(J) - I_1'(J) - \eta(J) + U\}] = \beta(J) \tag{3.1.1}$$

Equation (3.1.1) is solved for $\eta(J)$:

$$n_{23} \cdot \sin(I_1(J) - I_1'(J) - \eta(J) + U) = \sin[\beta(J) - \eta(J)] \tag{3.1.2}$$

Use the formula:

$$\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$$

And substitute:

$$x = \sin(\eta(J)) \; ; \; \sqrt{1 - x^2} = \cos(\eta(J))$$

Equation (3.1.2) will turn into the form:

$$x = \sqrt{\frac{1}{1 + A^2}} \tag{3.1.3}$$

Where:

$$A = \frac{n_{23} \cdot \cos[I_1(J) - I_1'(J) + U] - \cos[\beta(J)]}{n_{23} \cdot \sin[I_1(J) - I_1'(J) + U] - \sin[\beta(J)]} \tag{3.1.4}$$

Therefore:

$$\eta(J) = \sin^{-1}[x] \tag{3.1.5}$$

Knowing $\eta(J)$, $I_2'(J)$ can be solved from equation (3.1), and then, $I_2(J)$ can be solved from equation (3.2).

3.1.3 Coordinates of the Front and of the Rear Surfaces

3.1.3.1 The First Ray

All the magnitudes will be normalized with respect to the radius R. R is the aperture for the lens. Therefore:

$$R = 1.0 \begin{cases} y_1(1) = R \\ x_1(1) = \dfrac{R}{\tan(\alpha)} \end{cases} \tag{3.6}$$

The thickness of the lens is defined:

$$T(1) = \sqrt{[x_2(1) - x_1(1)]^2 + [y_1(1) - y_2(1)]^2} \qquad (3.7)$$

Therefore, the appropriate coordinates of the rear surface are:

$$\begin{cases} x_2(1) = x_1(1) + T(1) \cdot \cos[\pi/2 - \alpha - I_1'(1)] \\ y_2(1) = y_1(1) - T(1) \cdot \sin[\pi/2 - \alpha - I_1'(1)] \end{cases} \qquad (3.8)$$

3.1.3.2 <u>The Other Rays: Coordinates of the Rear Surface</u>

The new point of the rear surface $x_2(J), y_2(J)$ will be the intersection between the surface and the ray.

(a) The equation of the surface:

$$y_2(J) = m[x_2(J) - BB'] \qquad (3.9)$$

$$m = \tan[\pi/2 - \eta(J - 1)] = \cot[\eta(J - 1)] \qquad (3.9.1)$$

$$BB' = BF - B'F$$

$$B'F = y_2(J - 1) \cdot [\cot[\pi/2 - \eta(J - 1)] + \cot[\beta(J - 1)]]$$

$$\therefore B'F = y_2(J - 1) \cdot \{\tan[\eta(J - 1)] + \cot[\beta(J - 1)]\} \qquad (3.9.2)$$

$$\therefore y_2(J) = \cot[\eta(J - 1)]\{x_2(J) - [BF - B'F]\} \qquad (3.9.3)$$

(b) The equation of the ray:

$$y_2(J) = -\tan[\beta(J)]x_2(J) + BF \cdot \tan[\beta(J)] \qquad (3.10)$$

$$\therefore y_2(J) = \tan[\beta(J)] \cdot \{-x_2(J) + BF\} \qquad (3.10.1)$$

From equations (3.9.3) and (3.10.1), the coordinates of the next point at the rear surface are found; those are:

$$\begin{cases} x_2(J) = \dfrac{BF\{\tan[\beta(J)] + \cot[\eta(J - 1)]\} - \cot[\eta(J-1)] \cdot B'F}{\cot[\eta(J - 1)] + \tan[\beta(J)]} \\ y_2(J) = \tan[\beta(J)]\{-x_2(J) + BF\} \end{cases} \qquad (3.11)$$

3.1.3.3 Coordinates of the Front Surface

(a) Equation of the rear surface:

$$y_1(J) = (\tan\alpha) \cdot x_1(J) \tag{3.12}$$

(b) Equation of the ray:

$$y_1(J) = m[x_1(J) - x_2(J)] + y_2(J) \tag{3.13}$$

where:
$$m = -\tan[\pi/2 - \alpha - I_1'(J)] \tag{3.13.1}$$

or:
$$m = -\cot[\alpha + I_1'(J)] \tag{3.13.2}$$

From equations (3.12) and (3.13) the intercept point is calculated:

$$x_1(J) = \frac{y_2(J) + x_2(J) \cdot \cot[\alpha + I_1'(J)]}{\tan\alpha + \cot[\alpha + I_1'(J)]}$$

$$y_1(J) = (\tan\alpha) \cdot x_1(J) \tag{3.14}$$

3.1.3.4 The Thickness at the New Point

$$T(J) = \sqrt{[x_2(J) - x_1(J)]^2 + [y_1(J) - y_2(J)]^2} \tag{3.15}$$

3.2 Skew Rays in the Homogeneous Case

3.2.1 Coordinate Transformation

The x,y coordinates will be shifted by the angle $\alpha_p$.

$$x' = x \cdot \cos(\alpha_p) - y \cdot \sin(\alpha_p) \tag{3.16.1}$$

$$y' = x \cdot \sin(\alpha_p) + y \cdot \cos(\alpha_p) \tag{3.16.2}$$

$$z' = z \tag{3.16.3}$$

3.2.2 Calculate the Intercept Point of the Front Surface

Assuming that the (0,0) point is at point A

(Refer to figure 2.), the following equations can be derived:

(a) Ray: $R_{ray}^2 = y^2 + z^2$ (3.17.1)

$$\therefore R_{ray} = \left[\frac{y_0'}{\cos(\alpha_p)} - (x + AB) \cdot \tan(\alpha_p)\right]^2 + z_0'^2 \quad (3.17.2)$$

Where $R_{ray}$ is the radius of the ray and the values for $y_0'$, $z_0'$ are known.

(b) Cone: $R_{cone} = \tan(\alpha) \cdot [x + AB]$ (3.18)

Solving equations (3.17.2), (3.18) for x results:

$$XO = -\frac{CDS}{A_2D_2} + \frac{\sqrt{CDS^2 + A_2D_2 \cdot CZD}}{A_2D_2} \quad (3.19.1)$$

$$YO = \frac{y_0'}{\cos(\alpha_p)} - XO \cdot \tan(\alpha_p) \quad (3.19.2)$$

$$ZO = z_0' \quad (3.19.3)$$

Where:

$$A_2D_2 = (\tan\alpha)^2 - (\tan\alpha_p)^2 \quad (3.20.1)$$

$$CDS = \frac{y_0'}{\cos\alpha_p}\tan\alpha_p + (AB)[A_2D_2] \quad (3.20.2)$$

$$CZD = \left(\frac{y_0'}{\cos\alpha_p}\right)^2 + z_0'^2 - (AB)^2[A_2D_2]^2 - 2(AB)\frac{y_0'}{\cos\alpha_p}\tan\alpha_p \quad (3.20.3)$$

### 3.2.3 Direction Cosines of the Normal

$$f = y^2 + z^2 - (\tan\alpha)^2(x + AB)^2 = 0 \quad (3.21)$$

$$\frac{\delta f}{\delta x} = -2(\tan\alpha)^2(x + AB) \quad (3.21.1)$$

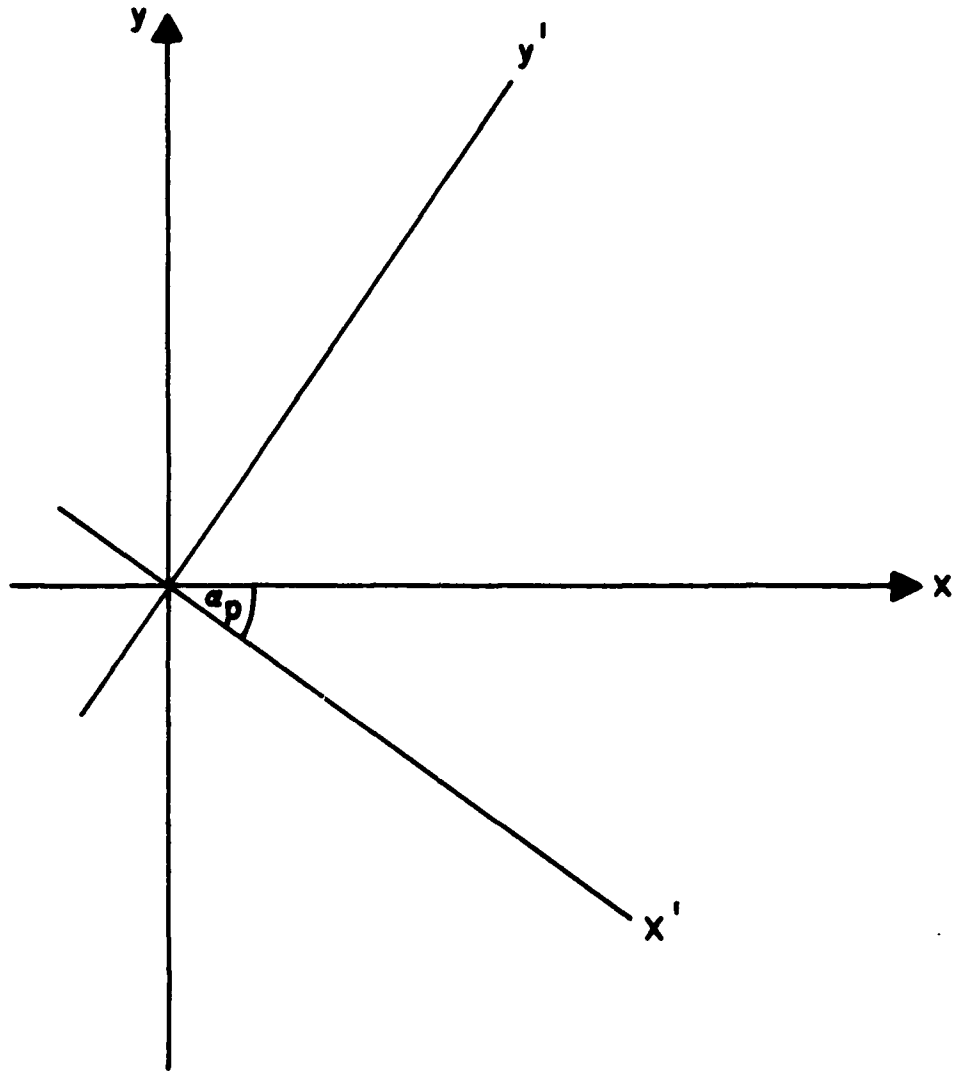



Figure 4. Diagram showing coordinate transformation for off-axis rays.

$$\frac{\delta f}{\delta y} = 2y \; ; \; \frac{\delta f}{\delta z} = 2z \tag{3.21.2}$$

$$|\overrightarrow{\Delta f}| = 2[(\tan\alpha)^4 (x + AB)^2 + y^2 + z^2]^{\frac{1}{2}} \tag{3.21.4}$$

Substituting equation (3.21) can turn equation (3.21.4) into the form:

$$|\overrightarrow{\Delta f}| = \frac{2\tan\alpha}{\cos\alpha} (x + AB) \tag{3.21.5}$$

The direction cosines of the normal are therefore:

$$n_X = \frac{(\delta f/\delta x)}{|\overrightarrow{\Delta f}|} = -\sin\alpha \tag{3.22}$$

$$n_Y = \frac{(\delta f/\delta y)}{|\overrightarrow{\Delta f}|} = \frac{2y}{2\tan\alpha/\cos\alpha\,(x + AB)} \tag{3.23}$$

Define: $\sigma = \tan^{-1}(z/y)$ (3.23.1)

$$y^2 + z^2 = (\tan\alpha)^2 (x + AB)^2$$

$$y^2 (1 + \tan^2\sigma) = \tan^2\alpha (x + AB)^2$$

$$y = (\cos\sigma)(\tan\alpha)(x + AB) \tag{3.23.2}$$

Therefore:

$$n_Y = (\cos\sigma)(\cos\alpha) \tag{3.23.3}$$

Similiarly:

$$n_Z = \frac{(\delta f/\delta z)}{|\overrightarrow{\Delta f}|} = (\sin\sigma)(\cos\alpha) \tag{3.24}$$

### 3.2.4 Refraction at the Front Surface

The skew ray $\vec{R}$ will be defined:

$$\vec{R} = R_X \cdot (\hat{e}_X) + R_Y \cdot (\hat{e}_Y) + R_Z \cdot (\hat{e}_Z) \tag{3.25}$$

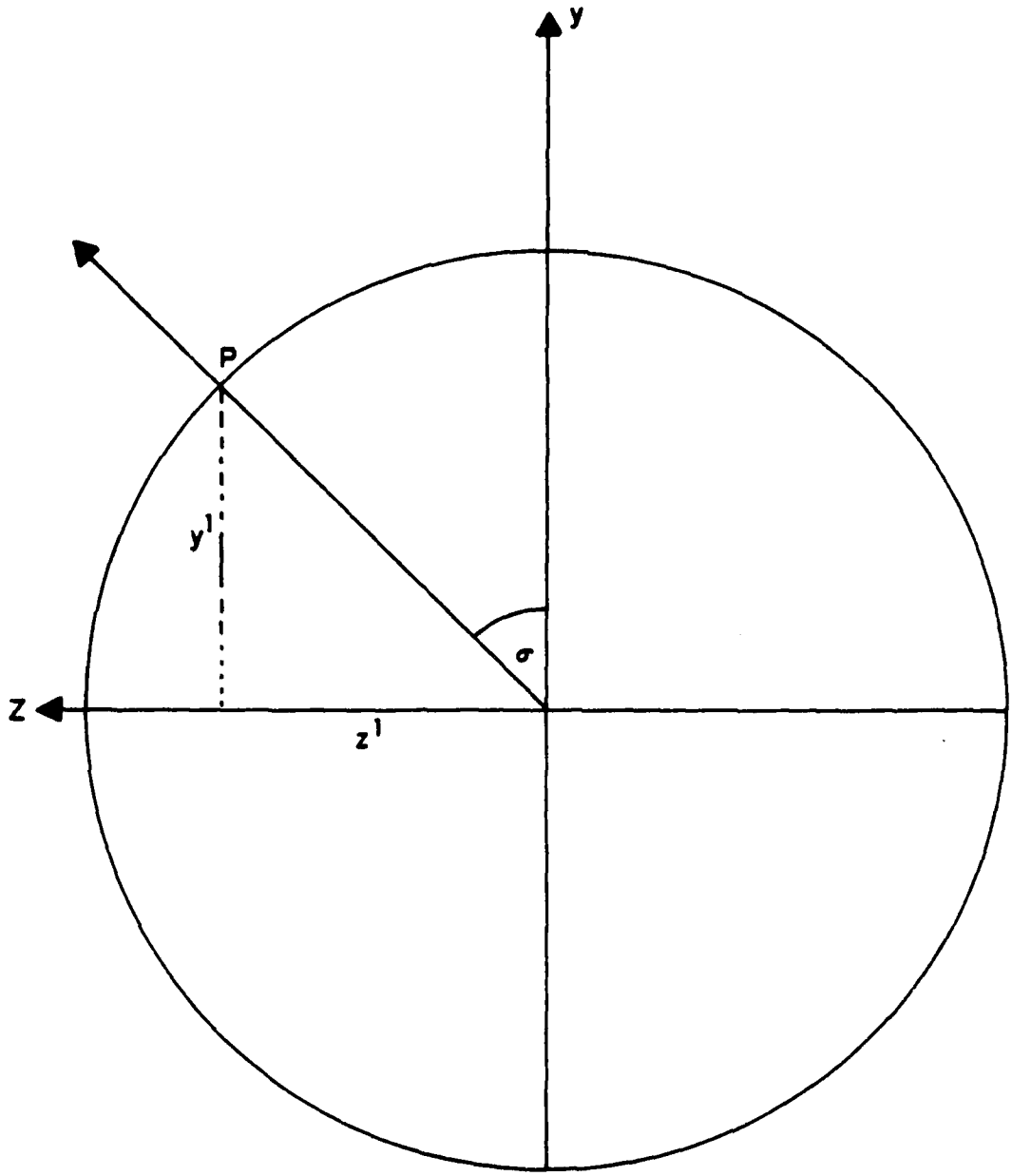



Figure 5. Cross section of lens in a plane normal to the lens axis. Point P is the point where an off-axis ray intersects the front surface of the lens.

Where $R_X$, $R_Y$, $R_Z$ are the direction cosines of the ray, and they have the value:

$$R_X = \cos\alpha_p \quad ; \quad R_Y = -\sin\alpha_p \quad ; \quad R_Z = 0 \tag{3.26}$$

The surface normal is defined by the following expression:

$$\vec{N} = n_X \cdot (\hat{e}_X) + n_Y \cdot (\hat{e}_Y) + n_Z(\hat{e}_Z) \tag{3.27}$$

Where the direction cosines of the normal surface were defined previously (equations 3.22, 3.23.3, 3.24).

The refracted angle at the front surface is defined:

$$\theta = \cos^{-1}\left\{\frac{\vec{R} \cdot \vec{N}}{|\vec{R}| \cdot |\vec{N}|}\right\} \tag{3.28}$$

Where:

$$\left.\begin{aligned} |\vec{R}| &= \sqrt{R_X^2 + R_Y^2 + R_Z^2} = 1 \\ |\vec{N}| &= \sqrt{n_X^2 + n_Y^2 + n_Z^2} = 1 \end{aligned}\right\} \tag{3.29}$$

Therefore:

$$\theta = \cos^{-1}\{R_X \cdot n_X + R_Y \cdot n_Y + R_Z \cdot n_Z\} \tag{3.30}$$

$$\left.\begin{aligned} \phi &= \pi - \theta \\ \phi' &= \sin^{-1}[n_{12} \cdot \sin\phi] \end{aligned}\right\} \tag{3.31}$$

### 3.2.5 Refraction Equations

Referring to figure 6 the refraction at the rear surface with regard to the front surface will be as follows [16, p. 147]:

$$n_2\vec{R}' = n_1\vec{R} + [n_2\cos(\phi') - n_1\cos(\phi)]\vec{N}$$

The direction cosines of the normal surface were defined in

equations (3.22), (3.23.3), (3.24) and the direction cosines of the ray at the front surface were defined in equation (3.26). The direction cosines of the skew ray at the rear surface, will therefore be:

$$\left.\begin{aligned} K' &= n_{12}\, R_Z + [\cos(\phi') - n_{12}\cos(\phi)] \cdot n_X \\ L' &= n_{12}\, R_Y + [\cos(\phi') - n_{12}\cos(\phi)] \cdot n_Y \\ M' &= n_{12}\, R_Z + [\cos(\phi') - n_{12}\cos(\phi)] \cdot n_Z \end{aligned}\right\} \qquad (3.32)$$

### 3.2.6 Intercept at the Rear Surface

The equation of the cone of the rear surface is:

$$y^2 + z^2 = [ax - b]^2 \qquad (3.33)$$

where a is the slope and is defined from figure 7.

$$a = \tan(\xi_J) = \frac{R_J}{X_J - X_v} = \frac{R_{J+1} - R_J}{X_{J+1} - X_J} \qquad (3.33.1)$$

b is the intercept at the X - axis and is calculated from equation (3.33.1):

$$b = X_v = \frac{R_{J+1} \cdot X_J - R_J \cdot X_{J+1}}{R_{J+1} - R_J} \qquad (3.33.2)$$

(XI, YI, ZI) is the point of intercept at the rear surface. The equation of the rear surface is therefore:

$$YI^2 + ZI^2 - (aXI - b) = 0 \qquad (3.33.3)$$

where a,b were defined in equations (3.33.1), (3.33.2).

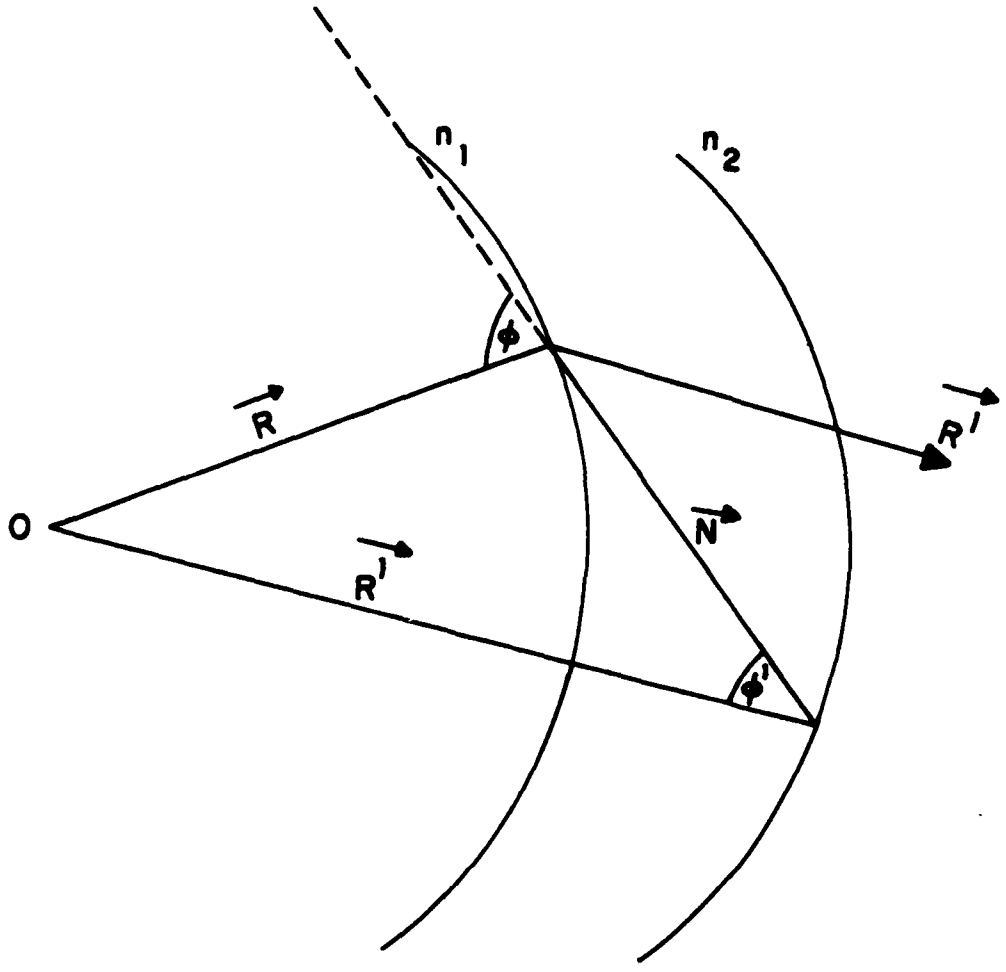



Figure 6. Diagram used to calculate the direction cosines of skew rays at the rear surface. This diagram is based on Kingslake [16].

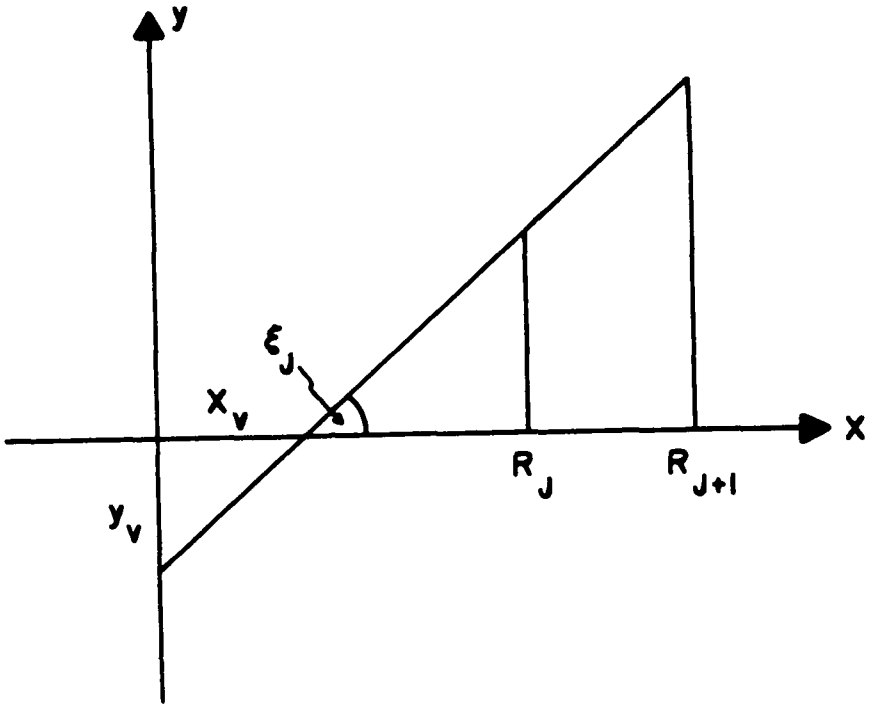



Figure 7. Geometry of a truncated cone which represents a small portion of the rear surface of the lens. The cone angle is $\xi_J$.

The direction cosines of the ray at the rear surface were defined previously (3.32). They are:

$$K' = \frac{XI - XO}{D} \quad ; \quad L' = \frac{YI - YO}{D} \quad ; \quad M' = \frac{ZI - ZO}{D} \tag{3.34}$$

(XO, YO, ZO) is the point of intercept at the front surface (3.19.1, 3.19.2, 3.19.3).

$$D = \sqrt{(XI - XO)^2 + (YI - YO)^2 + (ZI - ZO)^2} \tag{3.35}$$

Solving for D from equations (3.33.3) and (3.34) one gets:

$$D = -\frac{b'}{a'} + \frac{\sqrt{b'^2 - a'c'}}{a'} \tag{3.36}$$

Where:

$$a' = (L')^2 + (M')^2 - a^2(K')^2 \tag{3.36.1}$$

$$b' = (L')YO + (M')ZO - (K')a^2(XO - b/a) \tag{3.36.2}$$

$$c' = YO^2 + ZO^2 - a^2XO(XO - 2b/a) - b^2 \tag{3.36.3}$$

Knowing D, the intercept point at the rear surface can be verified using equation (3.34):

$$\begin{cases} XI = K'D + XO & (3.37.1) \\ YI = L'D + YO & (3.37.2) \\ ZI = M'D + ZO & (3.37.3) \end{cases}$$

### 3.2.7 Equation of the Normal to the Rear Surface

The equation of the cone of the rear surface was defined previously (eq. 3.33):

$$f(x,y,z,) = -(ax - b)^2 + y^2 + z^2 = 0 \tag{3.33}$$

a,b are defined in equations (3.33.1), (3.33.2).

$$\vec{\nabla} f = \hat{e}_X \frac{\delta f}{\delta X} + \hat{e}_Y \frac{\delta f}{\delta Y} + \hat{e}_Z \frac{\delta f}{\delta Z} \tag{3.38.1}$$

Similar to what was done at the front surface:

$$\frac{\delta f}{\delta X} = -2a(ax - b) \tag{3.38.2}$$

$$\frac{\delta f}{\delta Y} = 2y \quad ; \quad \frac{\delta f}{\delta Z} = 2z \tag{3.38.3}$$

$$\begin{aligned} |\vec{\nabla} f| &= [(\frac{\delta f}{\delta X})^2 + (\frac{\delta f}{\delta Y})^2 + (\frac{\delta f}{\delta Z})^2]^{\frac{1}{2}} \\ &= 2[a^2(ax - b)^2 + y^2 + z^2]^{\frac{1}{2}} \\ &= 2(ax - b)[(1 + a^2)^{\frac{1}{2}}] \end{aligned} \tag{3.38.4}$$

The direction cosines of the normal to the surface are as follows:

$$n_X = \frac{(\delta f/\delta X)}{|\vec{\nabla} f|} = \frac{-a}{(1 + a^2)^{\frac{1}{2}}} \tag{3.39.1}$$

$$n_Y = \frac{y}{(y^2 + z^2)^{\frac{1}{2}}(1 + a^2)^{\frac{1}{2}}} \tag{3.39.2}$$

$$n_Z = \frac{z}{(y^2 + z^2)^{\frac{1}{2}}(1 + a^2)^{\frac{1}{2}}} \tag{3.39.3}$$

### 3.2.8 Refraction at the Rear Surface

Similar to what was done at the front surface:

$$\vec{R}' = K'(\hat{e}_X) + L'(\hat{e}_Y) + M'(\hat{e}_Z) \tag{3.40.1}$$

$$\vec{N} = n_X(\hat{e}_X) + n_Y(\hat{e}_Y) + n_Z(\hat{e}_Z) \tag{3.40.2}$$

Where the direction cosines of the refracted ray ($\vec{R}'$) and the normal ($\vec{N}'$) were defined previously (equations 3.32, 3.39).

The refracted angle at the rear surface:

$$\phi_I = \cos^{-1} \frac{\vec{R}' \cdot \vec{N}'}{|\vec{R}'| \cdot |\vec{N}'|} \tag{3.41}$$

Both the ray and the normal are normalized; therefore:

$$\phi_I = K'n_X + L'n_Y + M'n_Z \tag{3.41.1}$$

$$\phi_I' = \sin^{-1}[n_{23} \cdot \sin\phi_I] \tag{3.41.2}$$

3.2.9 Direction Cosines of Rear External Refracted Ray

As done previously (equation 3.32):

$$\left.\begin{aligned} K'' &= n_{23}K' - [\cos(\phi_I') - n_{23}\cos(\phi_I)] \cdot n_X \\ L'' &= n_{23}L' - [\cos(\phi_I') - n_{23}\cos(\phi_I)] \cdot n_Y \\ Z'' &= n_{23}Z' - [\cos(\phi_I') - n_{23}\cos(\phi_I)] \cdot n_Z \end{aligned}\right\} \tag{3.42}$$

3.2.10 Intersection with the Image Plane

$$\left.\begin{aligned} X_{Im} &= BF = D_3K'' + XI \\ Y_{Im} &= D_3L'' + YI \\ Z_{Im} &= D_3M'' + ZI \end{aligned}\right\} \tag{3.43}$$

Solving equation (3.43), the intercept with the image plane can be calculated:

$$\left.\begin{aligned} D_3 &= (BF - XI)/K'' \\ Y_{Im} &= \left(\frac{BF - XI}{K''}\right) L'' + YI \\ Z_{Im} &= \left(\frac{BF - XI}{K''}\right) M'' + ZI \end{aligned}\right\} \tag{3.43.1}$$

## 4. FORMULATION OF EQUATIONS FOR GRIN LENS DESIGN

### 4.1 Solving the Integral for $\theta_e$

As mentioned in section 2:

$$\theta_e = \theta_0 + E\int_{r_f}^{r_r} \frac{d_r}{r\{r^2 n(r)^2 - E^2\}^{\frac{1}{2}}} \tag{4.1}$$

$r_f$, $r_r$ are the radii to the front surface and to the rear surface, respectively.

$$E = \epsilon \cdot n_2(r_f) \cdot r_f \cdot \sin\psi_f \tag{4.2}$$

$$n = \sqrt{A + B\left(\frac{r}{r_0}\right)^2} \tag{4.3}$$

Substituting:

$$V = \left(\frac{r_0}{r}\right)^2 \quad ; \quad \frac{dV}{dr} = -2r_0{}^2 r^{-3} \tag{4.1.1}$$

Equation (4.1) turns into the form:

$$\theta_e = \theta_0 - \frac{E}{2r_0}\int_{V_f}^{V_r} \frac{dV}{\left\{AV + b - V^2\frac{E^2}{r_0{}^2}\right\}^{\frac{1}{2}}} \tag{4.1.2}$$

Therefore:

$$\theta_e = -\tfrac{1}{2}\left[\sin^{-1}\left\{\frac{2(E/r_0)^2 V - A}{(A^2 + 4BE^2/r_0{}^2)^{\frac{1}{2}}}\right\}\right]_{(r_0/r_f)^2}^{(r_0/r_r)^2}$$

or:

$$\theta_e = -\tfrac{1}{2}\left[\sin^{-1}\left\{\frac{2E^2/r_r{}^2 - A}{(A^2 + 4BE^2/r_0{}^2)^{\frac{1}{2}}}\right\} - \sin^{-1}\left\{\frac{2E^2/r_f{}^2 - A}{(A^2 + 4BE^2/r_0{}^2)^{\frac{1}{2}}}\right\}\right] \tag{4.1.3}$$

The appropriate expression for the radius will therefore be:

$$r_{(r,f)} = \frac{\sqrt{2}|E|}{\sqrt{A + \sqrt{A^2 + 4BE^2/r_0^2}} \cdot \sin\left\{\mp 2\theta_e + \sin^{-1} \frac{2E^2/r_{(f,r)} - A}{\sqrt{A^2 + 4BE^2/r_0^2}}\right\}} \tag{4.4}$$

If the radius to the rear surface ($r_r$) is calculated from a known radius to the front surface ($r_f$) the minus sign is used in front of the angle $\theta_e$. This situation occurs with skew ray calculation. The plus sign is used when $r_f$ is calculated from a known $r_r$. This situation occurs for lens design.

## 4.2 Meridian Plane

### 4.2.1 Solution for the First Ray

#### (a) Define Point $X_1(1), Y_1(1)$

As in the homogeneous case:

$$\left.\begin{aligned} R &= 1.0 \\ Y_1(1) &= R \\ X_1(1) &= \frac{R}{\tan\alpha} \end{aligned}\right\} \tag{4.5}$$

#### (b) Define Angle to the Front Radius

$$\tan(\theta_0 + \theta_e) = \frac{R}{X_1(1) - X_C} \tag{4.6}$$

$$r_f(1) = r_0 = \frac{R}{\sin(\theta_0(1) + \theta_e(1))} \tag{4.7}$$

Refering to figure 8, $\theta_0$ is the angle to the rear radius, $\theta_e$

is the angle between the rear and the front radii, and $X_C$ is the location of the center of symmetry.

(c) Choose $\theta_e$ from Initial Thickness

$$\left.\begin{aligned} \theta_e(1) &= T(1)/r_f(1) \\ \theta_0(1) &= (\theta_0(1) + \theta_e(1)) - \theta_e(1) \end{aligned}\right\} \quad (4.8)$$

(d) Solve for $\psi_f$

$$\left.\begin{aligned} \alpha + I_1(1) + u &= \pi/2 \\ I_1(1) &= \pi/2 - \alpha - u \end{aligned}\right\} \quad (4.9)$$

Knowing $r_f(1)$, the initial index of refraction $(n_2(r_f))$ can be calculated from eq. (4.3). Therefore:

$$\sin(I_1(1)) = n_2(r_f)/n_3 \cdot \sin(I_1'(1))$$

$$I_1'(1) = \sin^{-1}[n_3/n_2(r_f) \cdot \sin[I_1(1)]] \quad (4.10)$$

Refering to figure 8, $\psi_f$ can be calculated.

$$\theta_e(1) + \theta_0(1) = \alpha + \delta$$

$$\therefore \delta = \theta_e(1) + \theta_0(1) - \alpha \quad (4.11)$$

$$\delta + \psi_f(1) - I_1'(1) = \pi/2$$

$$\psi_f(1) = \pi/2 + I_1'(1) - \delta \quad (4.12)$$

(e) Solve for E

$$E = \epsilon \cdot n_r(r_f) \cdot r_f \cdot \sin\psi_f \quad (4.2)$$

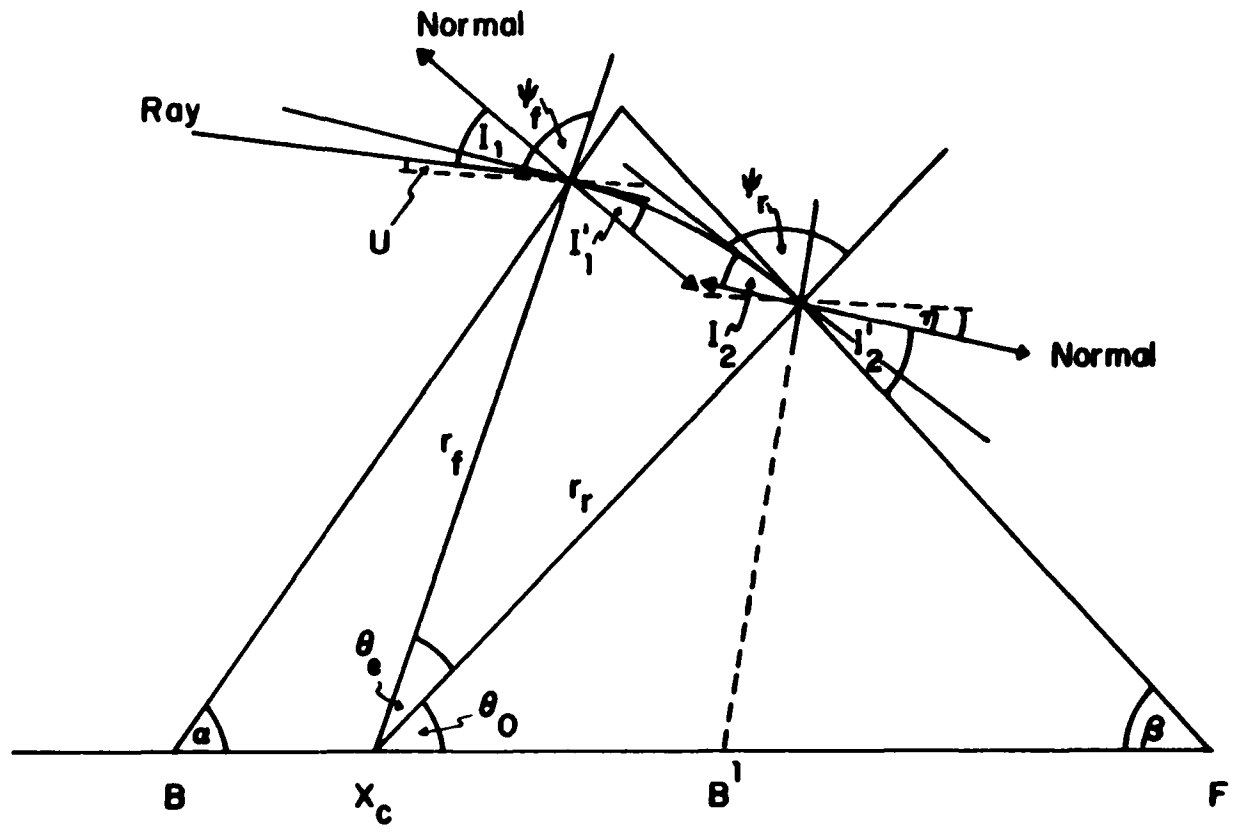



Figure 8. Diagram degining angles and coordinates for a ray transmitted by the GRIN lens. For the case illustrated B is negative.

Where:
$$\epsilon = \pm 1 \begin{cases} \psi \leq \pi/2 \rightarrow \epsilon = +1 \\ \psi > \pi/2 \rightarrow \epsilon = -1 \end{cases} \qquad (4.2.1)$$

(f) Solve for $r_f, \psi_r$

Knowing the radius to the front surface ($r_f$) and the angle between the two radii ($\theta_e$), the radius to the rear surface ($r_r$) can be calculated using equation (4.4). Using equation (4.2), $\psi_r$ can be calculated:

$$\psi_r = \sin^{-1}\left[\frac{E}{\epsilon \cdot n_2(r_r) \cdot r_r}\right] \qquad (4.2.2)$$

(g) Solve for $\beta(1)$

The focal length, which is an input, is known:

$$BF = F/R$$

The coordinates at the rear surface are:

$$\left.\begin{aligned} Y_2(1) &= r_r \sin(\theta_0(1)) \\ X_2(1) &= X_C + r_r \cos(\theta_0(1)) \end{aligned}\right\} \qquad (4.13)$$

Using equation (4.13), $\beta(1)$ can be calculated:

$$\beta(1) = \tan^{-1}\left[\frac{Y_2(1)}{BF - X_2(1)}\right] \qquad (4.14)$$

(h) Solve for the Refractive Angles at the Front Surface

As in the homogeneous case:

$$\eta(J) + I_2'(J) = \beta(J) \tag{4.15}$$

$$\sin[I_2(J)] = n_3/n_2(r_r) \cdot \sin[I_2'(J)] \tag{4.16}$$

$$\psi_r(J) + I_2(J) + \eta(J) + \theta_0(J) = \pi \tag{4.17}$$

Solve for $\eta(J)$ in a manner similar to the homogeneous case:

$$\eta(J) = \sin^{-1}\left[\sqrt{\frac{1}{1 + A^2}}\right] \tag{4.18}$$

Where:
$$A = \frac{\cos\delta' - n_3/n_2(r_r) \cdot \cos\beta(J)}{\sin\delta' - n_3/n_2(r_r) \cdot \sin\beta(J)} \tag{4.18.1}$$

Where:
$$\delta' = \pi - \theta_0(J) - \psi_0(J) \tag{4.18.2}$$

Knowing $\eta(J)$, $I_2'(J)$ can be solved from eq. (4.15) and then, $I_2(J)$ can be solved from equation (4.16).

### 4.2.2 Solution for Next Rays

#### 4.2.2.1 Coordinates at the Rear Surface

Solve for the subsequent rays the same way as in the homogeneous case (equations 3.10, 3.10.1).

#### 4.2.2.2 Calculate Radius and Angle to the Rear Surface

$$r_r(J) = \sqrt{(X_2(J) - X_C)^2 + Y_2(J)^2} \tag{4.19}$$

$$\theta_0(J) = \tan^{-1}[Y_2(J)/(X_2(J) - X_C)] \tag{4.20}$$

4.2.2.3 Solve Front Surface Parameters

Refer to Figure 8 for a definition of geometrical variables.

(a) Equations

$$\eta(J) + I_2'(J) = \beta(J) \tag{4.15}$$

$$\sin[I_2(J)] = n_3/n_2(r_r) \cdot \sin[I_2'(J)] \tag{4.16}$$

$$\psi_r(J) + I_2(J) + \eta(J) + \theta_0(J) = \pi \tag{4.17}$$

$$E = \varepsilon \cdot n_2(r_r) \cdot r_r \cdot \sin[\psi_r(J)] \tag{4.2.2}$$

$$E = \varepsilon \cdot n_2(r_f) \cdot r_f \cdot \sin[\psi_f(J)] \tag{4.2}$$

$$\theta_e(J) + \theta_0(J) = \alpha + \delta \tag{4.21}$$

$$\delta + \psi_f(J) - I_1'(J) = \pi/2 \tag{4.22}$$

$$r_f = f(r_r, \theta_e(J)) \tag{4.4}$$

$$\sin[I_1(J)] = n_2(r_f)/n_1 \cdot \sin[I_1'(J)] \tag{4.23}$$

$$\alpha + I_1(J) + u = \pi/2 \tag{4.24}$$

(b) Solution by Iteration

An explicit solution is not possible. An iterative solution is necessary.

(b1) Assume $\theta_e(J)$.

(b2) Solve for coordinates of the front surface:

- Calculate $I_1(J)$ from eq. (4.24)
- Calculate $\delta$ from eq. (4.21)
- Calculate front surface coordinates and radius:

$$Y_1(J) = \tan(\theta_0(J) + \theta_e(J)) \cdot (X_1(J) - X_C) \quad (4.25)$$

$$Y_1(J) = \tan\alpha \cdot X_1(J) \quad (4.26)$$

The result is:

$$\begin{cases} X_1(J) = \dfrac{X_C \cdot \tan[\theta_0(J) + \theta_e(J)]}{\tan[\theta_0(J) + \theta_e(J)] - \tan\alpha} & (4.27) \\ Y_1(J) = \tan\alpha \cdot X_1(J) & (4.26) \end{cases}$$

$$r_f = Y_1(J)/\sin[\theta_0(J) + \theta_e(J)] \quad (4.28)$$

$$= \frac{X_C \cdot \tan\alpha}{\sin[\theta_0(J) + \theta_e(J)] - \tan\alpha \cdot \cos[\theta_0(J) + \theta_e(J)]} \quad (4.28.1)$$

(b3) Knowing $r_f$, $I_1'(J)$ can be solved using equation (4.23).

- Calculate $\psi_f$ from eq. (4.22)
- Calculate E from eq. (4.2)

(b4) Calculate second expression for front radius ($r_f$) from eq. (4.4).

(b5) The iteration routine:

The iteration search for correct $\theta_e$ uses the Newton-Raphson routine.

The function:

$$F = r_{ff} - r_f = 0 \quad (4.29)$$

$r_{ff}$ is the expression from the formula (eq. 4.4) where $r_f$ is the geometric expression (eq. 2.28).

The derivative is found with respect to $\theta_e$:

$$F' = \frac{d(r_{ff})}{d(\theta_e)} - \frac{d(r_f)}{d(\theta_e)} \qquad (4.30)$$

$$\frac{d(r_{ff})}{d(\theta_e)} = \pm \frac{(r_{ff})^3}{2E^2} \cdot B_1 \cdot \cos[\mp 2\theta_e + \sin^{-1}(B_2)] \qquad (4.30.1)$$

Where:

$$B_1 = \sqrt{A^2 + 4B(E/r_r)^2} \qquad (4.30.2)$$

$$B_2 = [2(E/r_r)^2 - A]/B_1 \qquad (4.30.3)$$

The lower signs are used when the front radius ($r_f$) is calculated from a known rear radius ($r_r$) (this case occurs at $J > 1$), while the upper signs are used when $r_r$ is calculated from $r_f$ (for $J=1$).

$$\frac{d(r_f)}{d(\theta_e)} = \frac{-X_C \cdot \tan\alpha \cdot \{\cos[\theta_0(J) + \theta_e(J)] + \tan\alpha \cdot \sin[\theta_0(J) + \theta_e(J)]\}}{\{\sin[\theta_0(J) + \theta_e(J)] - \tan\alpha \cdot \cos[\theta_0(J) + \theta_e(J)]\}^2} \qquad (4.30.4)$$

(c) Correct Solution

After knowing the correct value for $\theta_e(J)$, the procedure used in (b) can be followed resulting in the correct values for:
$I_1(J)$, $\delta$, $X_1(J)$, $Y_1(J)$, $r_f(J)$, $I_1'(J)$, $\psi_f(J)$, E. Using equation (4.2.2) $\psi_r$ can be calculated. Equations (4.15), (4.16), (4.17) can be solved for $\eta(J)$, $I_2'(J)$, $\beta(J)$ as shown previously for the J=1 case (equations 4.18, 4.15, 4.16).

## 4.3 Skew Rays

### 4.3.1 Front Surface

As in the homogeneous sace, the intercept point at the front surface (XO, YO, ZO) can be found (equations 3.19.1, 3.19.2, 3.19.3).

Also, the direction cosines of the normal to the front surface can be calculated (equations 3.22,3.23). The direction cosines of the ray can be found as well using equation (3.26).

### 4.3.2 Front Radius

Knowing the intercept point at the front surface, the front radius can be calculated:

$$r_f(J) = [(XO - X_C)^2 + (YO)^2 + (ZO)^2]^{\frac{1}{2}} \qquad (4.31)$$

Knowing $r_f(J)$, the initial index of refraction $[n_2(r_f)]$ can be calculated using equation (4.3).

### 4.3.3 Refraction at the Front Surface

As for the homogeneous case (section 3.2.4), the refracted angle at the front surface can be calculated using equations (3.30), (3.31).

### 4.3.4 Initial Direction Cosines for the Internal Refracted Ray

The initial direction cosines of the internal refracted ray (K',L',M') are calculated the same way as for the homogeneous case (section 3.2.5, equation 3.32). The vector form of the initial direction of the ray is therefore:

$$\vec{R} = K' \cdot \hat{e}_X + L' \cdot \hat{e}_Y + M' \cdot \hat{e}_Z \qquad (4.32)$$

### 4.3.5 Front Radius Direction Cosines

The vector form of the front radius is defined as follows:

$$\vec{r}_f = r_{fX} \cdot \hat{e}_X + r_{fY} \cdot \hat{e}_Y + r_{fZ} \cdot \hat{e}_Z \tag{4.33}$$

Where the direction cosines are:

$$\left.\begin{aligned} r_{fX} &= (XO - X_C)/r_f(J) \\ r_{fY} &= YO/r_f(J) \\ r_{fZ} &= ZO/r_f(J) \end{aligned}\right\} \tag{4.33.1}$$

### 4.3.6 Normal to Plane of the Curved Ray at (XO,YO,ZO)

The vector cross product of $\vec{r}_f$ and $\vec{R}$ is normal to the plane defined by the two vectors.

$$\vec{NP}_f = \vec{r}_f \times \vec{R} = \begin{vmatrix} \hat{e}_X & \hat{e}_Y & \hat{e}_X \\ r_{fX} & r_{fY} & r_{fZ} \\ K' & L' & M' \end{vmatrix} \tag{4.34}$$

$$\vec{NP}_f = NP_{fX} \cdot \hat{e}_X + NP_{fY} \cdot \hat{e}_Y + NP_{fZ} \cdot \hat{e}_Z \tag{4.34.1}$$

Where:

$$\left.\begin{aligned} NP_{fX} &= r_{fY} \cdot M' - r_{fZ} \cdot L' \\ NP_{fY} &= r_{fZ} \cdot K' - r_{fX} \cdot M' \\ NP_{fZ} &= r_{fX} \cdot L' - r_{fY} \cdot K' \end{aligned}\right\} \tag{4.34.2}$$

and

$$NP_f = \sqrt{NP_{fX}^2 + NP_{fY}^2 + NP_{fZ}^2} \tag{4.34.3}$$

The normalized direction cosines of the normal to the plane of the curved ray at (XO,YO,ZO) are therefore:

$$NP_{fX}/NP_f \;;\; NP_{fY}/NP_f \;;\; NP_{fZ}/NP_f \tag{4.34.4}$$

4.3.7 Calculating the Angle Between the Ray and the Front Radius

$$\vec{r}_f \cdot \vec{R} = |\vec{r}_f| \cdot |\vec{R}| \cdot \cos(\psi_f) \tag{4.35}$$

Both the ray and the unit vector for the front surface radius are normalized, i.e.

$$\left.\begin{aligned} |\vec{r}_f| &= (r_{fX}^2 + r_{fY}^2 + r_{fZ}^2)^{\frac{1}{2}} = 1 \\ |\vec{R}| &= (K'^2 + L'^2 + M'^2)^{\frac{1}{2}} = 1 \end{aligned}\right\} \tag{4.35.1}$$

Therefore:

$$\psi_f = \cos^{-1}[\vec{r}_f \cdot \vec{R}]$$

$$= \cos^{-1}[r_{fX} \cdot K' + r_{fY} \cdot L' + r_{fZ} \cdot M'] \tag{4.35.2}$$

4.3.8 Calculating constant E

Knowing $\psi_f$, constant E can be calculated using equation (4.2).

4.3.9 Intercept Point of the Curved Ray with Rear Surface (Point XI,YI,ZI)

4.3.9.1 Equations

As previously, $\theta_e$ is the angle between the front radius and the rear radius.

$$r_{rX} \cdot r_{fX} + r_{rY} \cdot r_{fY} + r_{rZ} \cdot r_{fZ} = \cos[\theta_e(J)] \tag{4.36}$$

The direction cosines of the front radius were calculated in equation (4.33). Similiarly, the direction cosines of the rear radius are:

$$\left.\begin{aligned} r_{rX} &= (XI - X_C / r_r(J) \\ r_{rY} &= YI/r_r(J) \\ r_{rZ} &= ZI/r_r(J) \end{aligned}\right\} \qquad (4.36.1)$$

Therefore, equation (4.36) can have the form:

$$(XI - X_C)r_{fX} + (YI)r_{fY} + (ZI)r_{fZ} = r_r(J) \cdot \cos[\theta_e(J)] \qquad (4.36.2)$$

The rear radius is defined as:

$$(XI - X_C)^2 + (YI)^2 + (ZI)^2 = [r_r(J)]^2 \qquad (4.37)$$

The rear surface was defined previously. Consequently:

$$-(aXI - b)^2 + (YI)^2 + (ZI)^2 = 0 \qquad (3.33)$$

a,b were defined by equations 3.33.1 and 3.33.2.

Also, from geometry:

$$(XI - X_C) = r_r(J) \cdot \cos[\theta_0(J)] \qquad (4.38)$$

Another equation arrives from the connection between the two radii through eq. (4.4).

4.3.9.2 Solution

a. Assume $\theta_e(J)$.

b. Calculate $r_r(J)$ from the formula (equation 4.4).

c. Calculate XI from equation (4.36.2):

$$XI = r_r(J) \cdot \cos[\theta_0(J)] + X_C \qquad (4.36.3)$$

d. Calculate radius from equations

(4.37) and (4.36.3):

$$\text{Radius} = R = [(YI)^2 + (ZI)^2]^{\frac{1}{2}}$$
$$= r_r(J)[1 - \cos^2[\theta_0(J)]]$$
$$= r_r(J) \cdot \sin[\theta_0(J)] \qquad (4.37.1)$$

e. Calculate parameters a and b from equations (3.33.1) and (3.33.2) as in the homogeneous case.

f. Substituting into equation (3.33):

$$XI = (R + b)/a = \{r_r(J) \cdot \sin[\theta_0(J)] + b\}/a \qquad (4.38)$$

where R is the radius defined in equation (4.37.1).

g. Solving equations (4.36.3), (4.38) for $\theta_0(J)$ one gets:

$$\theta_0(J) = \sin^{-1}\left[-\frac{B'}{A'} + \frac{\sqrt{(B')^2 - (A')(C')}}{A'}\right] \qquad (4.39)$$

Where:

$$\left.\begin{aligned} A' &= [r_r(J)]^2(1 + a^2) \\ B' &= [r_r(J)](b - a \cdot X_C) \\ C' &= (b - a \cdot X_C)^2 - a^2 \cdot [r_r(J)]^2 \end{aligned}\right\} \qquad (4.40)$$

h. Knowing $\theta_0(J)$, it is possible to calculate new value for $\theta_e(J)$ and iterate through steps (a) - (g) until the difference in the values of $\theta_0(J)$ is

small enough.

i. When an accurate value of $\theta_0(J)$ is received, XI is calculated from equation (4.36.3). YI and ZI are calculated using equations (4.36) and (4.37.1). Consequently:

$$\left.\begin{aligned} YI &= \frac{B''}{A''} + \frac{\sqrt{(B'')^2 - (A'')(C'')}}{A''} \\ ZI &= \sqrt{\{r_r(J) \cdot \sin[\theta_0(J)]\}^2 - \{YI\}^2} \end{aligned}\right\} \qquad (4.41)$$

Where:

$$\left.\begin{aligned} A'' &= 1 + [r_{fY}]^2/[r_{fZ}]^2 \\ B'' &= \{r_r(J) \cdot \cos[\theta_e(J)] - (XI - X_C) r_{fX}\} r_{fY}/r_{fZ} \\ C'' &= \left\{\frac{r_r(J)}{r_{fZ}} \cdot \cos[\theta_e(J)] - (XI - X_C)\frac{r_{fX}}{r_{fZ}}\right\}^2 - \left\{r_r(J) \cdot \sin[\theta_0(J)]\right\}^2 \end{aligned}\right\} \qquad (4.42)$$

When $r_{fZ} = 0$, the solution for YI and ZI is different:

$$YI = \{r_r(J) \cdot \cos[\theta_e(J)] - (XI - X_C) r_{fX}\}/r_{fY} \qquad (4.43)$$

While ZI is calculated by equation (4.41).

4.3.10 Direction Cosines of the Ray at the Rear Surface

a. Similarly to what was done at the front surface (equation 4.35):

$$\vec{r}_r \cdot \vec{R} = |\vec{r}_r| \cdot |\vec{R}| \cdot \cos(\psi_r) \qquad (4.44)$$

Both the ray and the rear radius are normalized; therefore:

$$r_{rX} \cdot K_r' + r_{rY} \cdot L_r' + r_{rZ} \cdot M_r' = \cos\psi_r \qquad (4.44.1)$$

b. The ray remains within the same plane while transfering from the front surface to the rear surface. i.e.:

$$NP_{fX} \cdot K_r' + NP_{fY} \cdot L_r' + NP_{fZ} \cdot M_r' = \cos(\pi/2) = 0 \qquad (4.45)$$

c. The direction cosines of the ray are normalized, i.e.

$$(K_r')^2 + (L_r')^2 + (M_r')^2 = 1 \qquad (4.46)$$

d. Solution:

(d1) $NP_{fX} \neq 0,\ NP_{fY} \neq 0,\ NP_{fZ} \neq 0$

$$\left.\begin{aligned} (L'_r) &= \frac{B''}{2A''} \pm \frac{\sqrt{(B'')^2 - 4(A'')(C'')}}{2A''} \\ (M'_r) &= \frac{C}{B} - \frac{A}{B}(L'_r) \\ (K'_r) &= [-NP_{fY} \cdot (L'_r) - NP_{fZ} \cdot (M'_r)]/NP_{fX} \end{aligned}\right\} \qquad (4.47)$$

Where:

$$\left.\begin{aligned} A &= NP_{fX} \cdot r_{rY} - NP_{fY} \cdot r_{rX} \\ B &= NP_{fX} \cdot r_{rZ} - NP_{fZ} \cdot r_{rX} \\ C &= NP_{fX} \cdot \cos(\psi_r) \\ A' &= \left(\frac{NP_{fY}}{NP_{fX}}\right)^2 + 1 \\ B' &= \left(\frac{NP_{fZ}}{NP_{fX}}\right)^2 + 1 \\ C' &= \frac{2(NP_{fY})(NP_{fZ})}{(NP_{fX})^2} \end{aligned}\right\} \qquad (4.48)$$

$$
\left.
\begin{aligned}
A'' &= (A') + (B')\left(\frac{A}{B}\right)^2 - \frac{(C')(A)}{(B)} \\
B'' &= \frac{2(A)(C)(B')}{(B)^2} - \frac{(C')(C)}{(B)} \\
C'' &= (B')\left(\frac{C}{B}\right)^2 - 1
\end{aligned}
\right\} \qquad (4.48)
$$

In (4.47) the (+) sign is used when $r_{rY} < 0$ while the (-) sign is used when $r_{rY} \geq 0$.

(d2) In the above case, when $\underline{B = 0}$ (look for definition of B in equation (4.48)) the solution for direction cosines of the ray is different.

$$
\left.
\begin{aligned}
(L'_r) &= \frac{C}{A} \\
(M'_r) &= -\frac{(C')(L'_r)}{2(B')} \pm \frac{\sqrt{\left[\frac{(C')(L'_r)}{2}\right]^2 - (B')[(A')(L'_r)^2 - 1]}}{B'} \\
(K'_r) &= [-NP_{fY} \cdot (L'_r) - NP_{fZ} \cdot (M'_r)]/NP_{fX}
\end{aligned}
\right\}
$$

(4.49)

All the symbols used here were defined in equation (4.48) and the ± sign is used as before.

(d3) $\underline{NP_{fX} = 0,\ NP_{fY} = 0,\ NP_{fZ} \neq 0,\ r_{rY} \neq 0}$

$$(M'_r) = 0 \qquad (4.50)$$

$$\left.\begin{aligned} (K'_r) &= \frac{B''}{A''} \pm \frac{\sqrt{(B'')^2 - (A'')(C'')}}{A''} \\ (L'_r) &= \frac{1}{r_{rY}} \left[\cos(\psi_r) - r_{rX} \cdot K'_r\right] \end{aligned}\right\} \qquad (4.50)$$

The (+) sign is used here.

While in this case:

$$\left.\begin{aligned} A'' &= 1 + \left(\frac{r_{rX}}{r_{rY}}\right)^2 \\ B'' &= \cos(\psi_r) \frac{r_{rX}}{(r_{rY})^2} \\ C'' &= \left[\frac{\cos(\psi_r)}{r_{rY}}\right]^2 - 1 \end{aligned}\right\} \qquad (4.51)$$

(d4) In the above case, when $r_{rY} = 0$ the solution is:

$$\left.\begin{aligned} (M'_r) &= 0 \\ (K'_r) &= \frac{\cos(\psi_r)}{r_{rX}} \\ (L'_r) &= \pm\sqrt{1 - (K'_r)^2} \end{aligned}\right\} \qquad (4.52)$$

Again, the (+) sign is used here.

(d5) $NP_{fX} = 0$, $NP_{fY} \neq 0$, $NP_{fZ} = 0$, $r_{rZ} \neq 0$

The solution is similar to that in case (d3).

$$\left.\begin{aligned} (L'_r) &= 0 \\ (K'_r) &= \frac{B''}{A''} \pm \frac{\sqrt{(B'')^2 - (A'')(C'')}}{(A'')} \\ (M'_r) &= \frac{1}{r_{rZ}} [\cos(\psi_r) - r_{rX} \cdot K'_r] \end{aligned}\right\} \qquad (4.53)$$

$(A'')$, $(B'')$, $(C'')$ are the same as defined in (4.51) except that $r_{rY}$ is replaced everywhere by $r_{rZ}$. The (+) sign is used here.

(d6) In the above case, when $r_{rZ} = 0$ the solution is similar to that in case (d4):

$$\left.\begin{aligned} (L'_r) &= 0 \\ (K'_r) &= \frac{\cos(\psi_r)}{r_{rX}} \\ (M'_r) &= \pm\sqrt{1 - (K'_r)^2} \end{aligned}\right\} \qquad (4.54)$$

Also here, the (+) sign is used.

(d7) $NP_{fX} = 0$, $NP_{fY} \neq 0$, $NP_{fZ} \neq 0$, $r_{rX} = 0$

$$\left.\begin{aligned} (L'_r) &= \frac{\cos(\psi_r)}{r_{rY} - \frac{NP_{fY}}{NP_{fZ}} \cdot r_{rZ}} \\ (M'_r) &= -\frac{NP_{fY}}{NP_{fZ}} (L'_r) \\ (K'_r) &= \pm\sqrt{1 - (L'_r)^2 - (M'_r)^2} \end{aligned}\right\} \qquad (4.55)$$

The (+) sign is used here.

(d8) As in (d7), but: $(r_{rY} - \frac{NP_{fY}}{NP_{fZ}} \cdot r_{rZ}) = 0$; $r_{rX} \neq 0$

$$\left.\begin{aligned} (K'_r) &= \frac{\cos(\psi_r)}{r_{rX}} \\ (L'_r) &= \pm \sqrt{\frac{1 - (K'_r)^2}{1 + \left(\frac{NP_{fY}}{NP_{fZ}}\right)^2}} \\ (M'_r) &= - \frac{NP_{fY}}{NP_{fZ}} (L'_r) \end{aligned}\right\} \qquad (4.56)$$

(d9) As in (d7), but: $r_{rX} \neq 0$

$$\left.\begin{aligned} (L'_r) &= \frac{(B")}{2(A")} \pm \frac{\sqrt{(B")^2 - 4(A")(C")}}{2(A")} \\ (M'_r) &= - \frac{NP_{fY}}{NP_{fZ}} (L'_r) \\ (K'_r) &= \frac{1}{r_{rX}} \left[\cos(\psi_r) - (r_{rY} - \frac{NP_{fY}}{NP_{fZ}} r_{rZ})(L'_r)\right] \end{aligned}\right\} \qquad (4.57)$$

As in case (d1), the (+) sign is used when: $r_{rY} < 0$ while the (-) sign is used when: $r_{rY} \geq 0$.

## 5. FLOW CHART OF PROGRAM LENS

(Homogeneous Case)

Note: Subroutines SHAPET, SKEWT compute the shape of lens and the skew rays as described in the previous sections (3,4). However, subroutines SHAPEC, SKEWC compute the shape and the skew rays of a different design of the lens. In this design, the fixed cone is the rear surface instead of the front surface (compare figure 9 to figure 2.). The equations for this different design are not included in the current report. The equations are part of Capt. Carr's thesis [15] and will be described there.

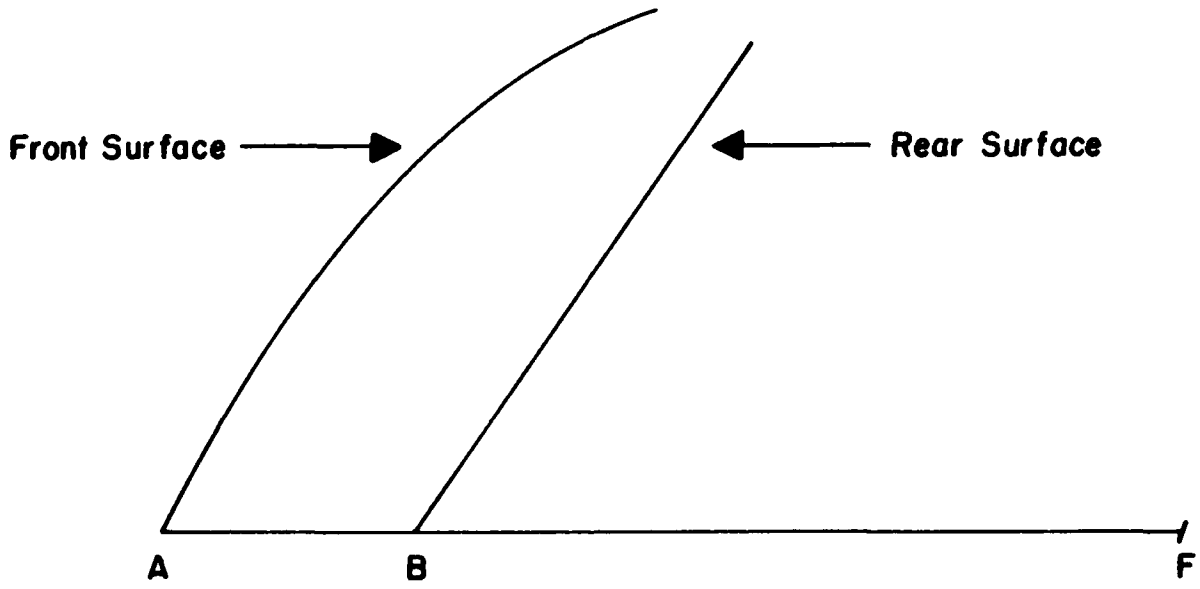
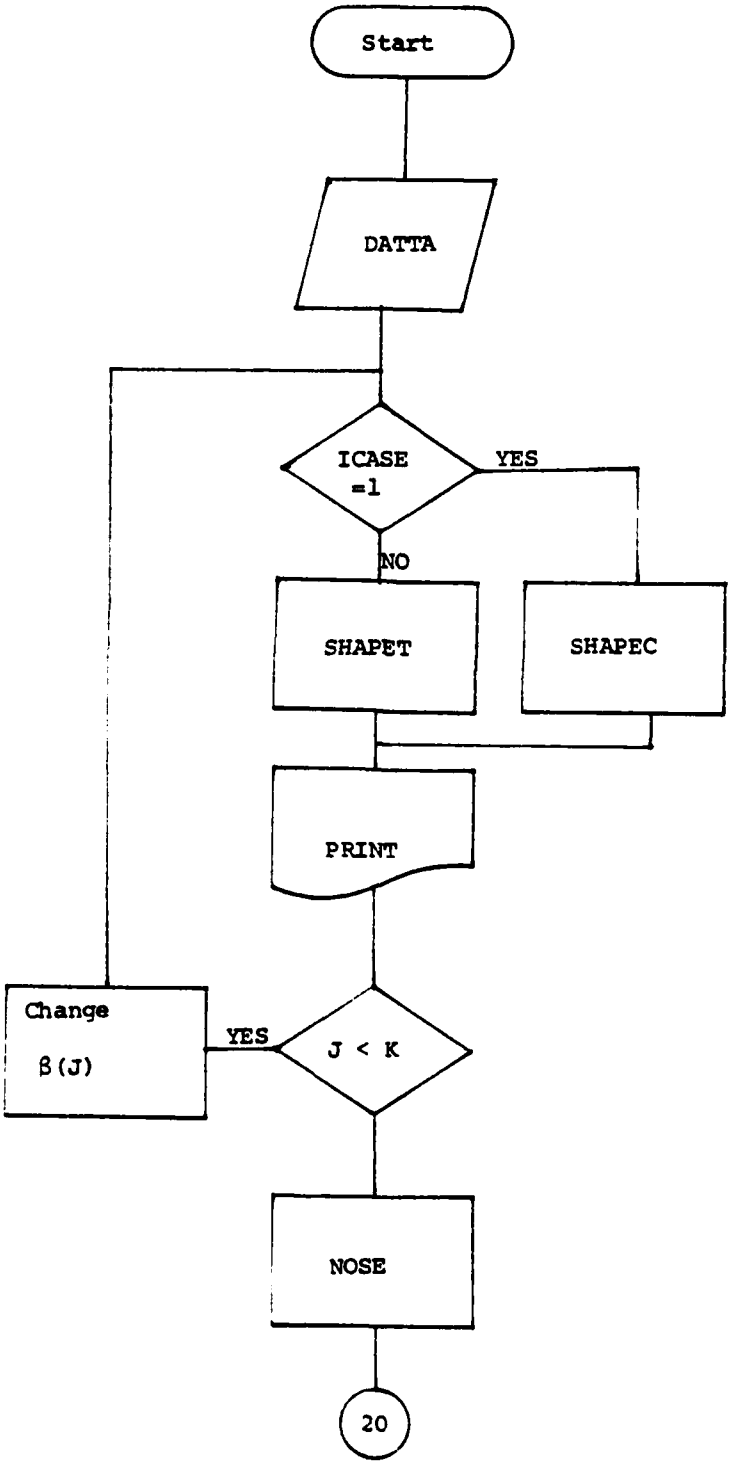
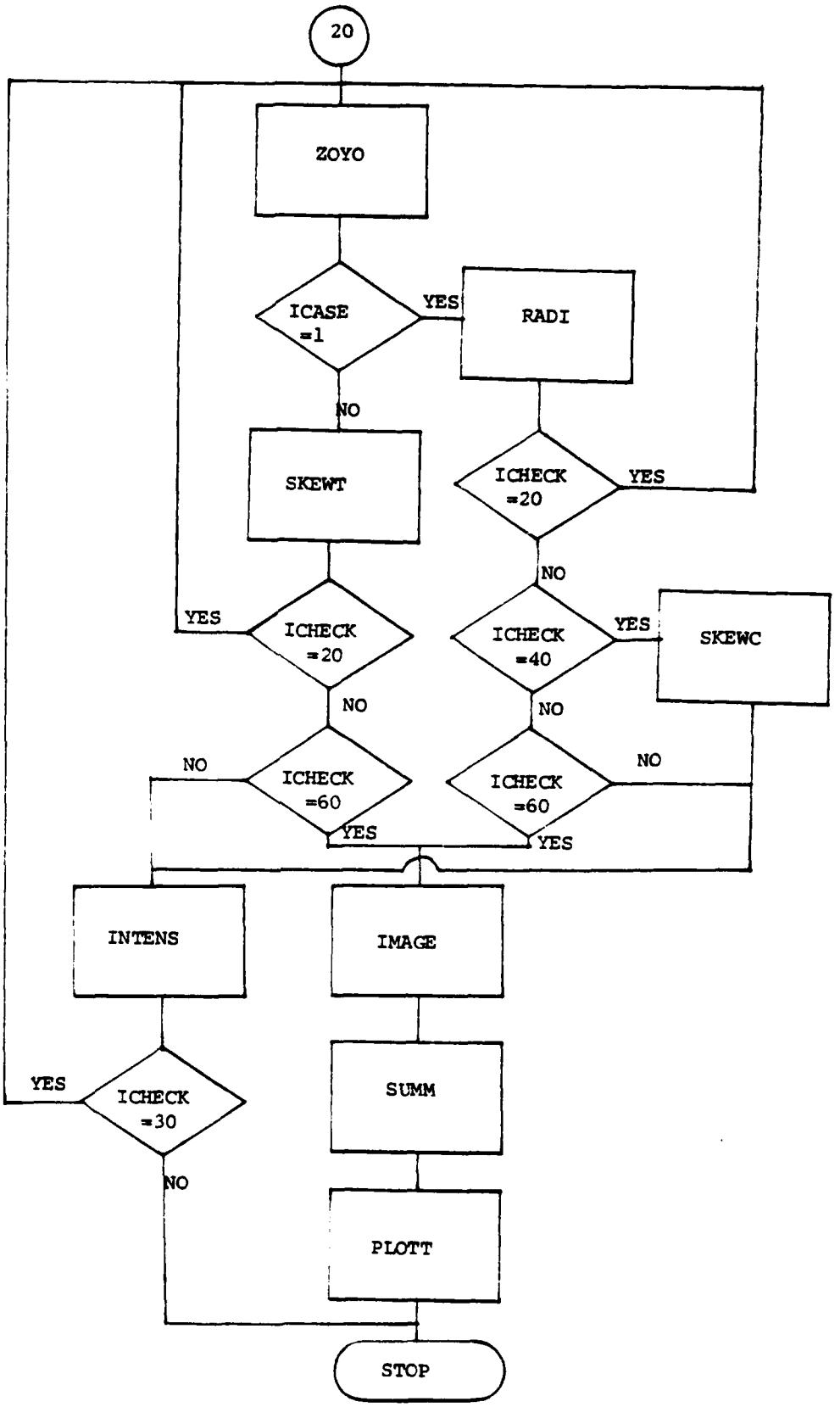


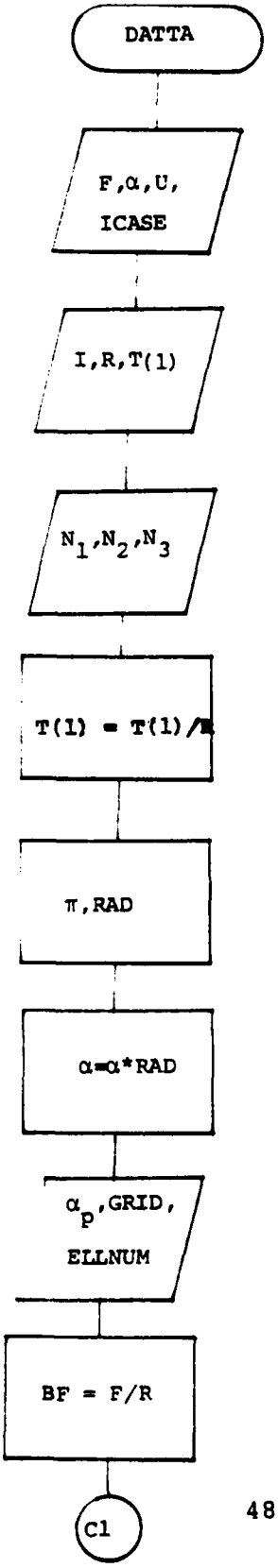


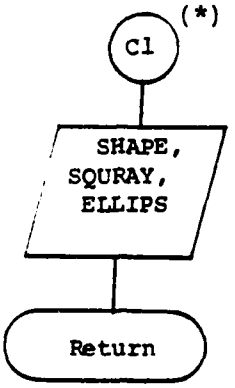

Figure 9. Illustration of the lens which has a circular cone on the inside surface.

## Program LENS - Main

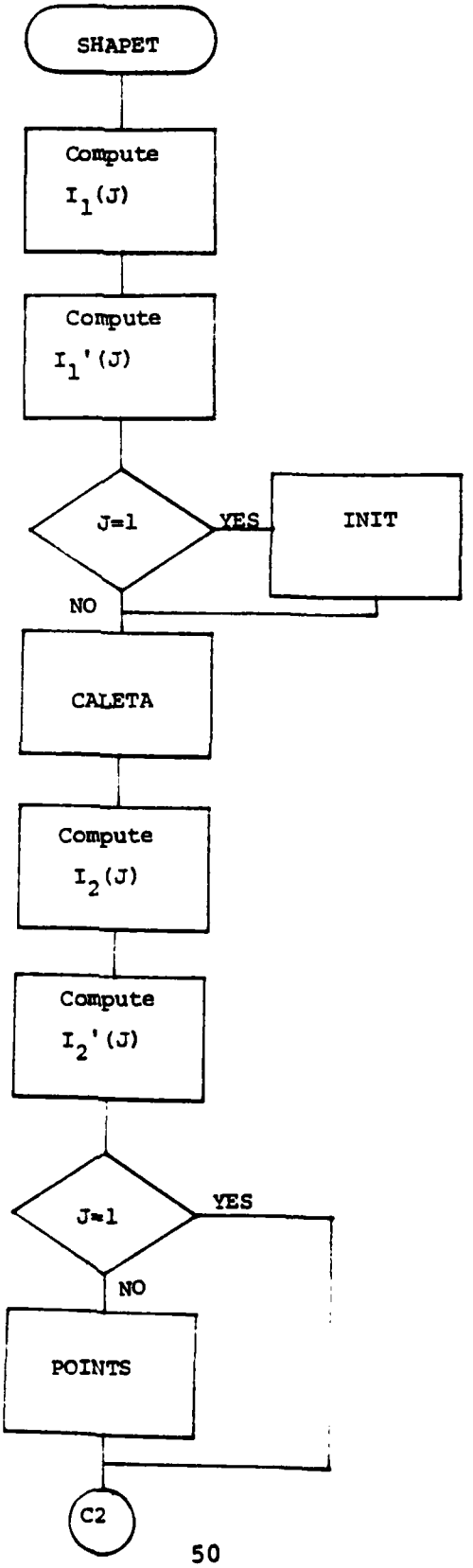


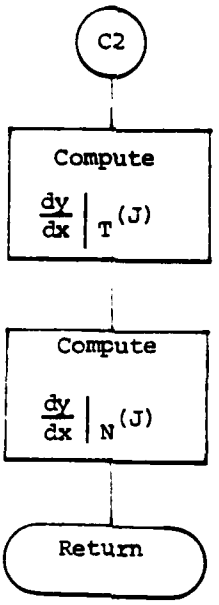

20
ZOYO
ICASE =1
YES
RADI
NO
SKEWT
ICHECK =20
YES
NO
YES
ICHECK =20
ICHECK =40
YES
SKEWC
NO
NO
NO
ICHECK =60
ICHECK =60
NO
YES
YES
INTENS
IMAGE
YES
ICHECK =30
SUMM
NO
PLOTT
STOP

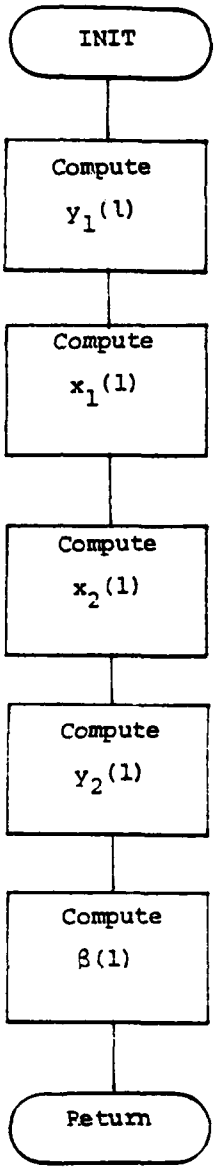

DATTA
F,α,U,
ICASE
I,R,T(1)
N1,N2,N3
T(1) = T(1)/
π,RAD
α=α*RAD
αp,GRID,
ELLNUM
BF = F/R
C1

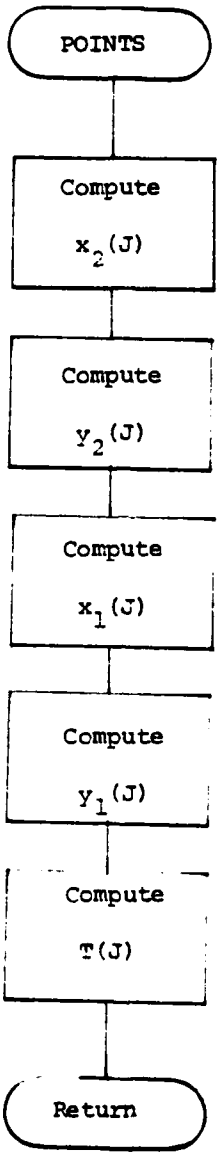


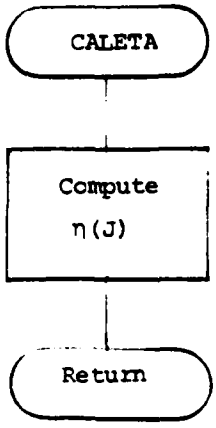

(*) In program GRIN, which uses the same subroutine, here, data for XC, DIV is given.

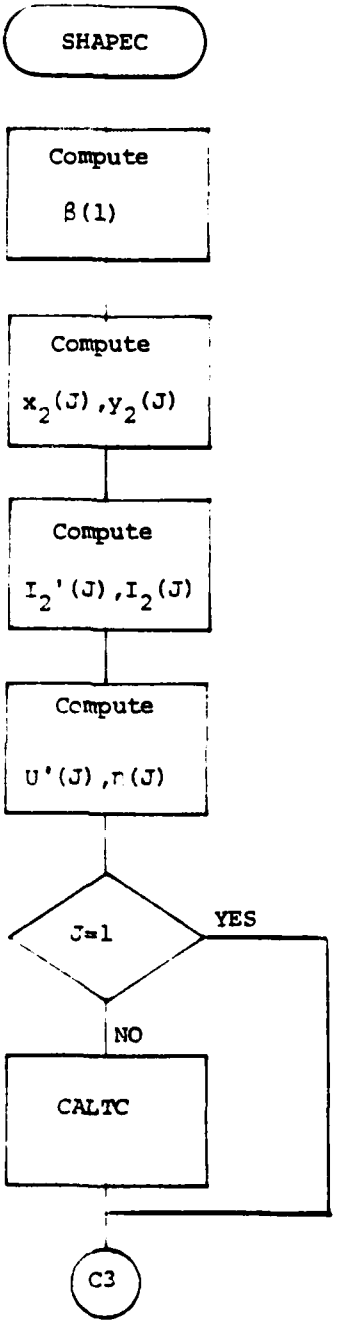

SHAPET
Compute
$I_1(J)$
Compute
$I_1'(J)$
J=1
YES
INIT
NO
CALETA
Compute
$I_2(J)$
Compute
$I_2'(J)$
J=1
YES
NO
POINTS
C2

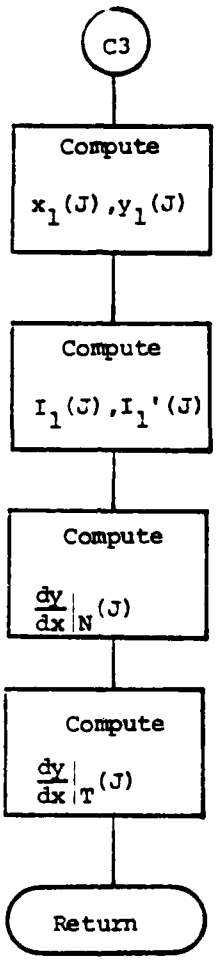

C2
Compute
$\frac{dy}{dx}\Big|_T(J)$
Compute
$\frac{dy}{dx}\Big|_N(J)$
Return

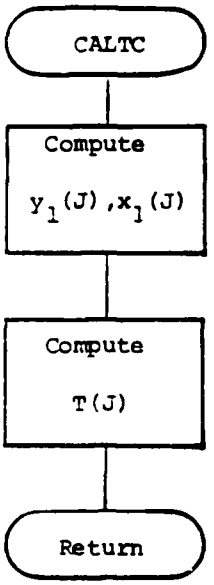

INIT
Compute
$y_1(1)$
Compute
$x_1(1)$
Compute
$x_2(1)$
Compute
$y_2(1)$
Compute
$\beta(1)$
Return

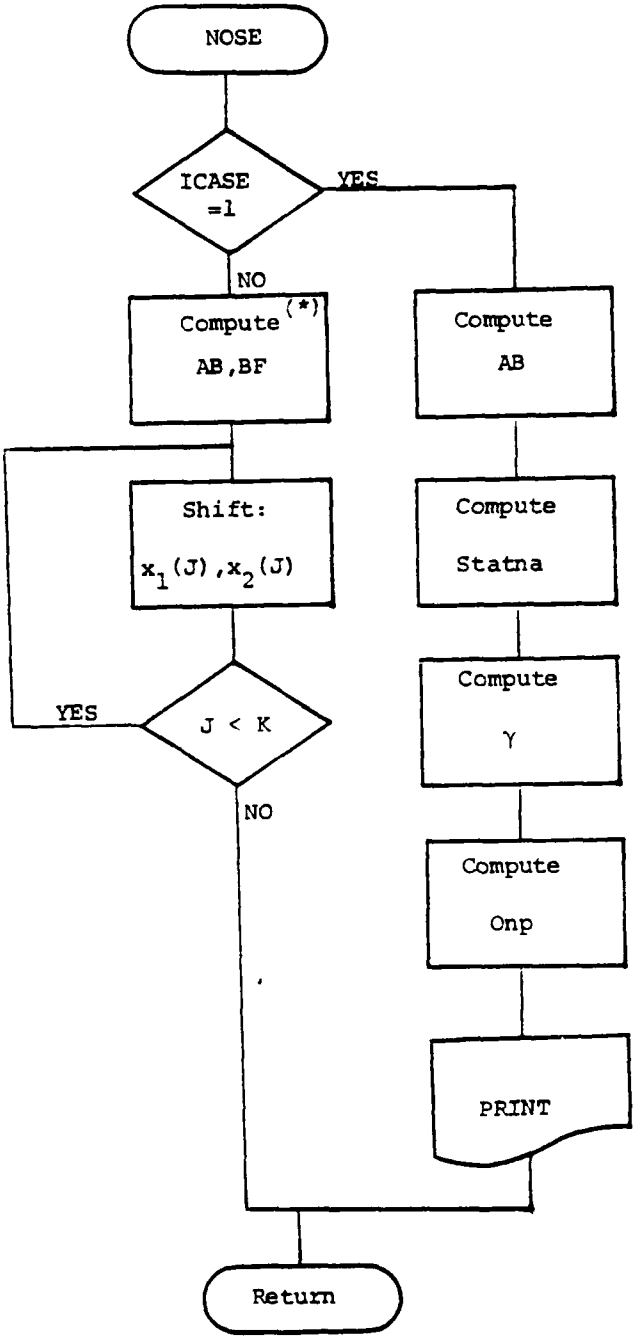

POINTS
Compute
$x_2(J)$
Compute
$y_2(J)$
Compute
$x_1(J)$
Compute
$y_1(J)$
Compute
T(J)
Return


CALETA
Compute
η(J)
Return

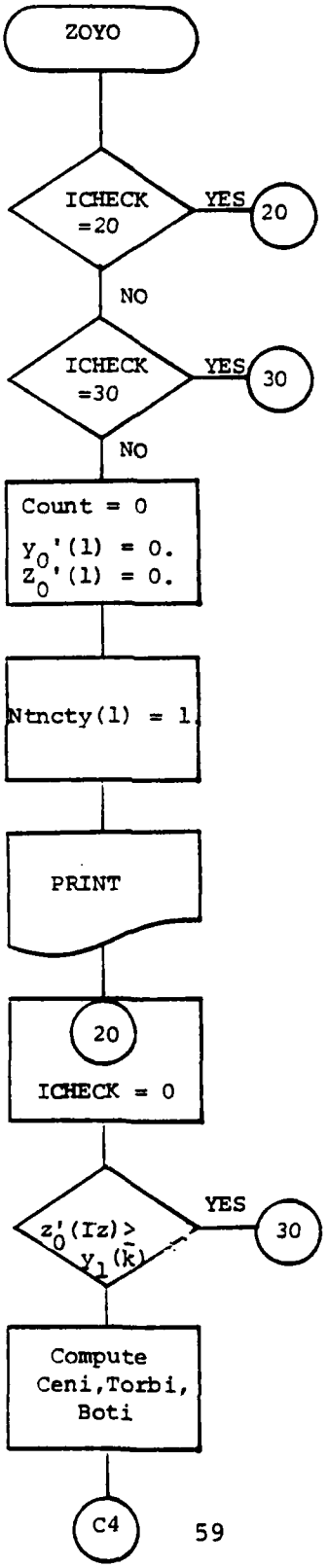

SHAPEC
Compute
β(1)
Compute
$x_2(J), y_2(J)$
Compute
$I_2'(J), I_2(J)$
Compute
U'(J), r(J)
J=1
YES
NO
CALTC
C3

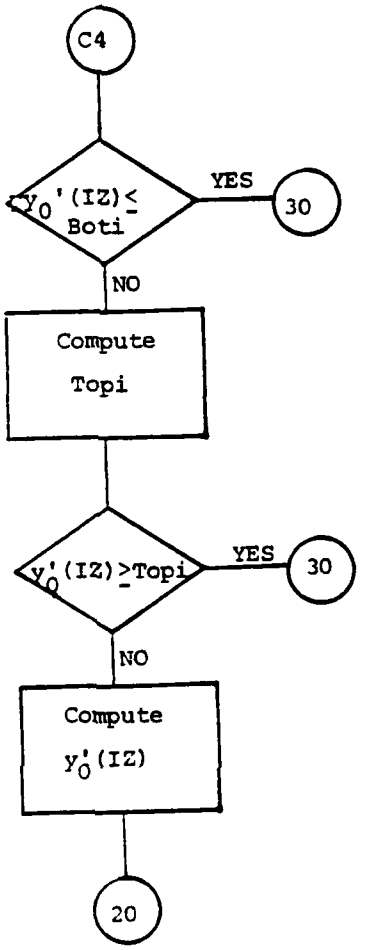

C3
Compute
$x_1(J), y_1(J)$
Compute
$I_1(J), I_1'(J)$
Compute
$\frac{dy}{dx}\Big|_N(J)$
Compute
$\frac{dy}{dx}\Big|_T(J)$
Return

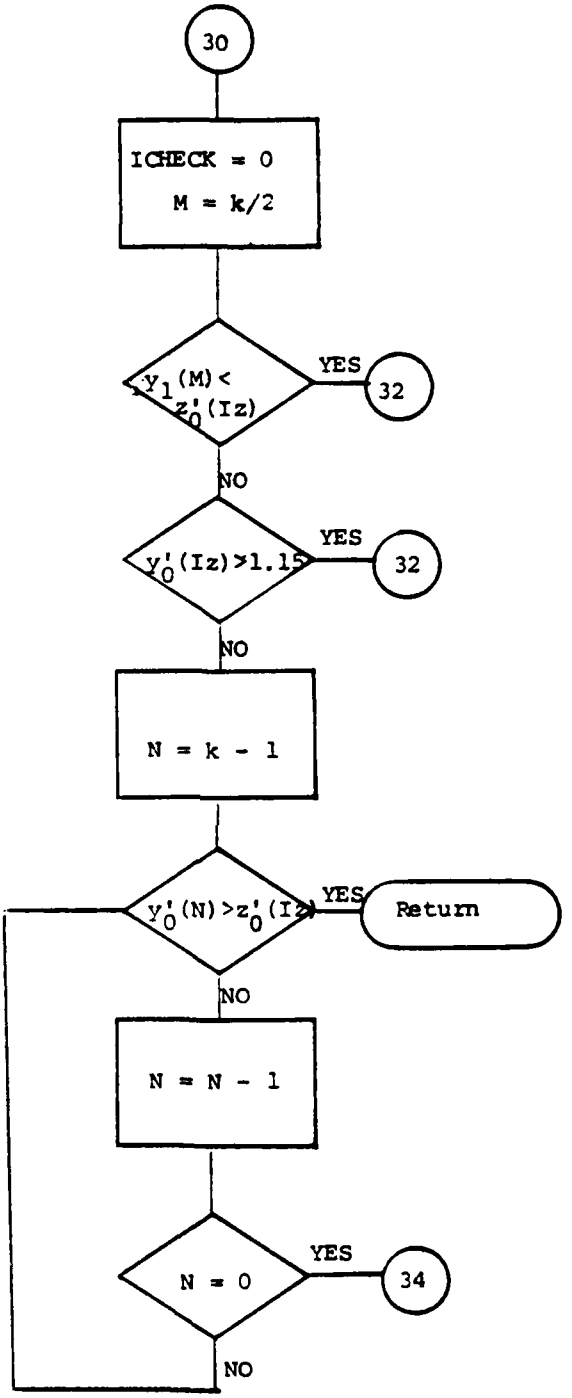

CALTC
Compute
$y_1(J), x_1(J)$
Compute
T(J)
Return

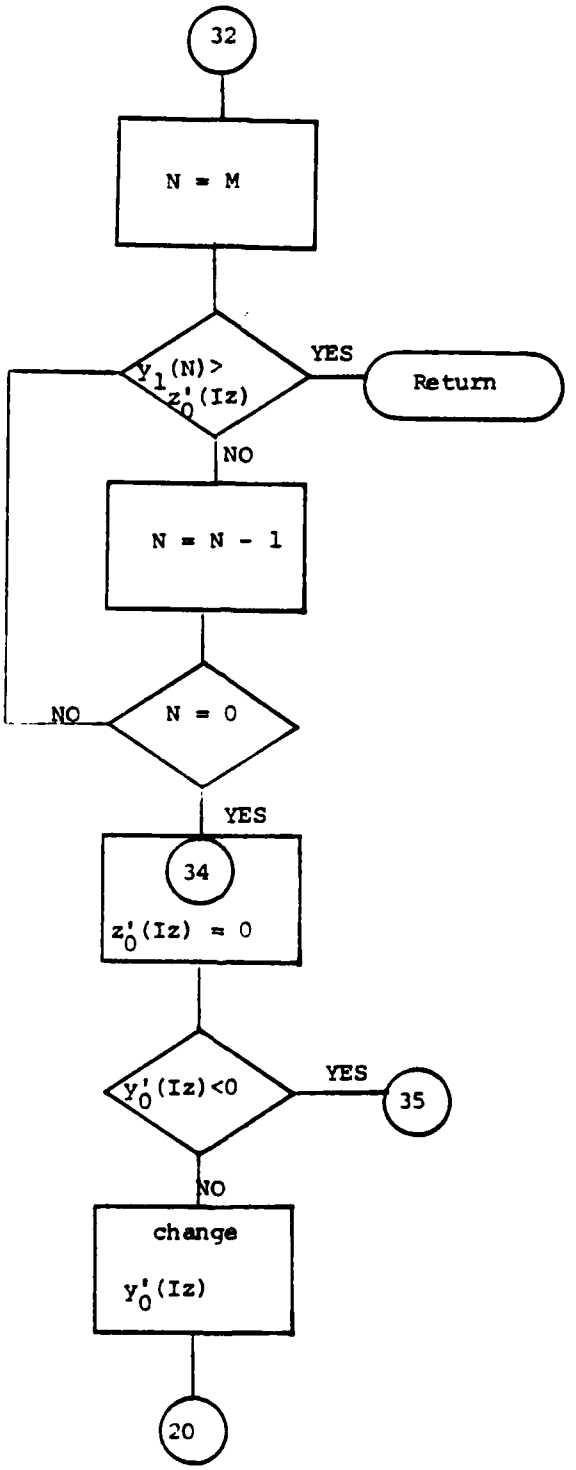


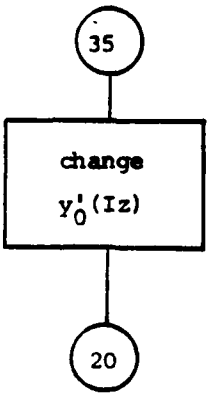

(*) In program GRIN, which uses the same subroutine, here, also xc is shifted.

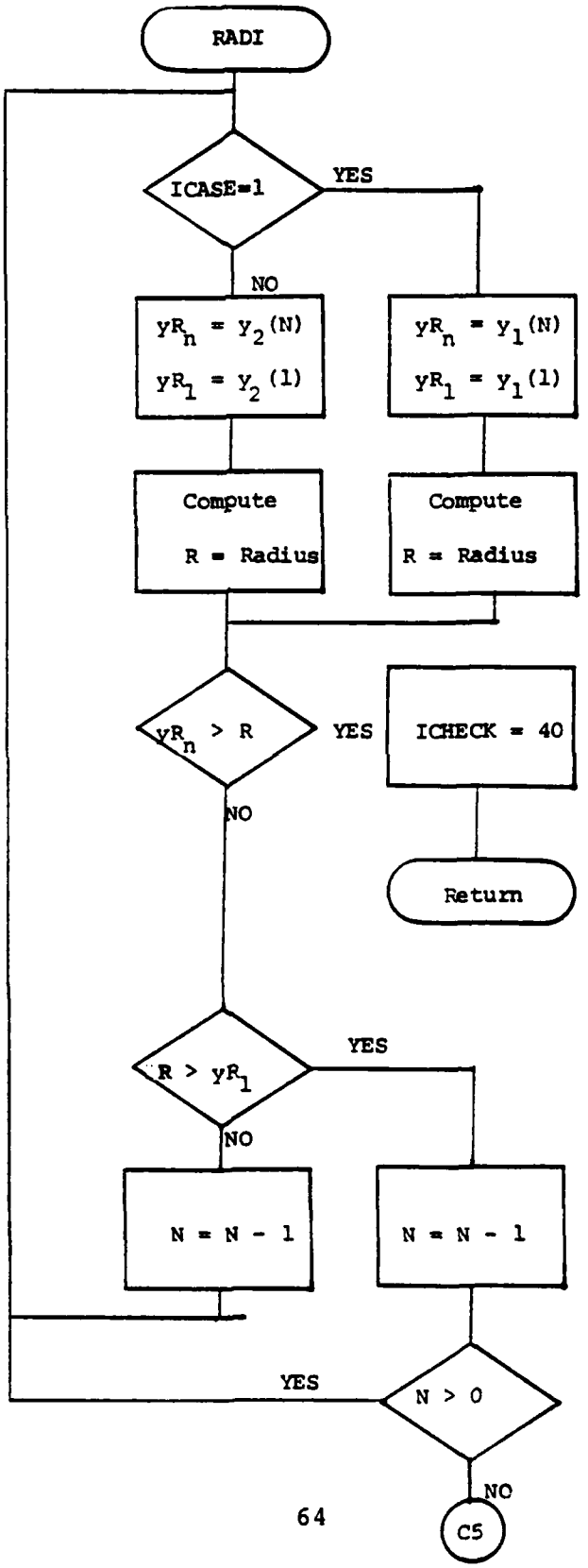

ZOYO
ICHECK =20
YES
20
NO
ICHECK =30
YES
30
NO
Count = 0
$y_0'(1) = 0.$
$z_0'(1) = 0.$
Ntncty(1) = 1
PRINT
20
ICHECK = 0
$z_0'(Iz) \geq y_1(k)$
YES
30
Compute Ceni,Torbi, Boti
C4

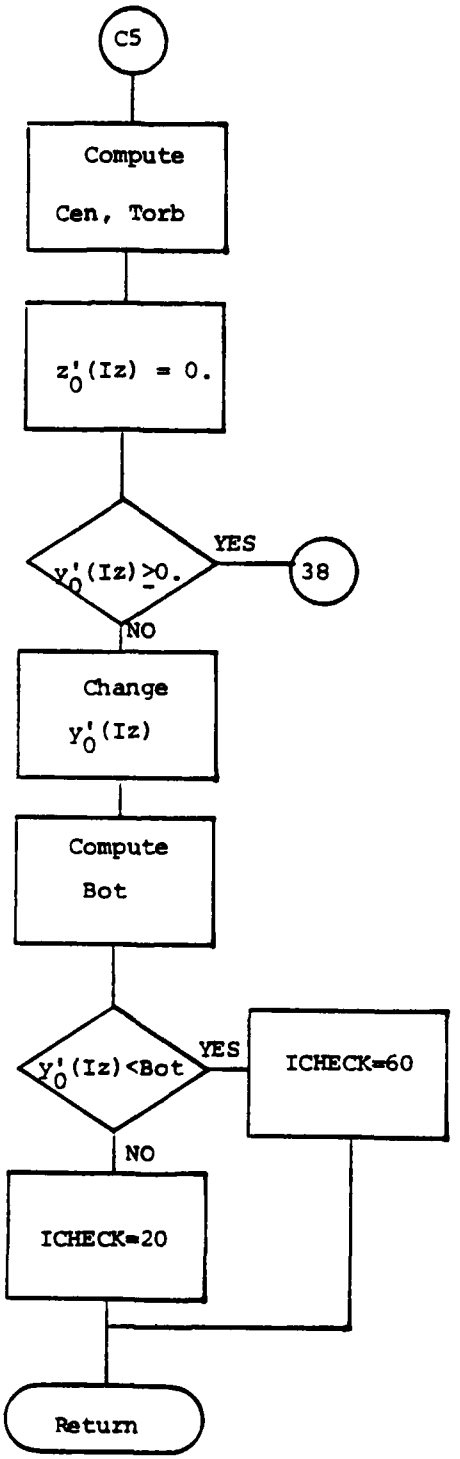

C4
$y_0'(IZ) \leq$ Boti
YES
30
NO
Compute Topi
$y_0'(IZ) \geq$ Topi
YES
30
NO
Compute $y_0'(IZ)$
20

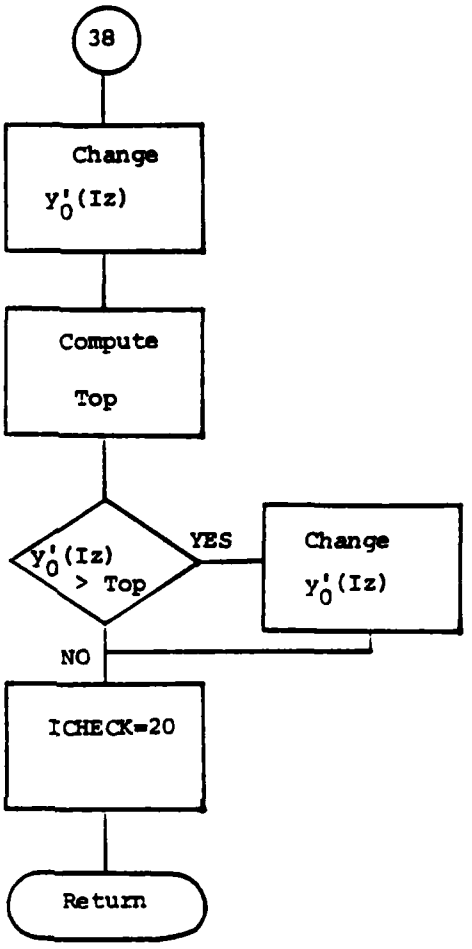

30
ICHECK = 0
M = k/2
$y_1(M) < z_0'(Iz)$
YES
32
NO
$y_0'(Iz) > 1.15$
YES
32
NO
N = k - 1
$y_0'(N) > z_0'(Iz)$
YES
Return
NO
N = N - 1
N = 0
YES
34
NO

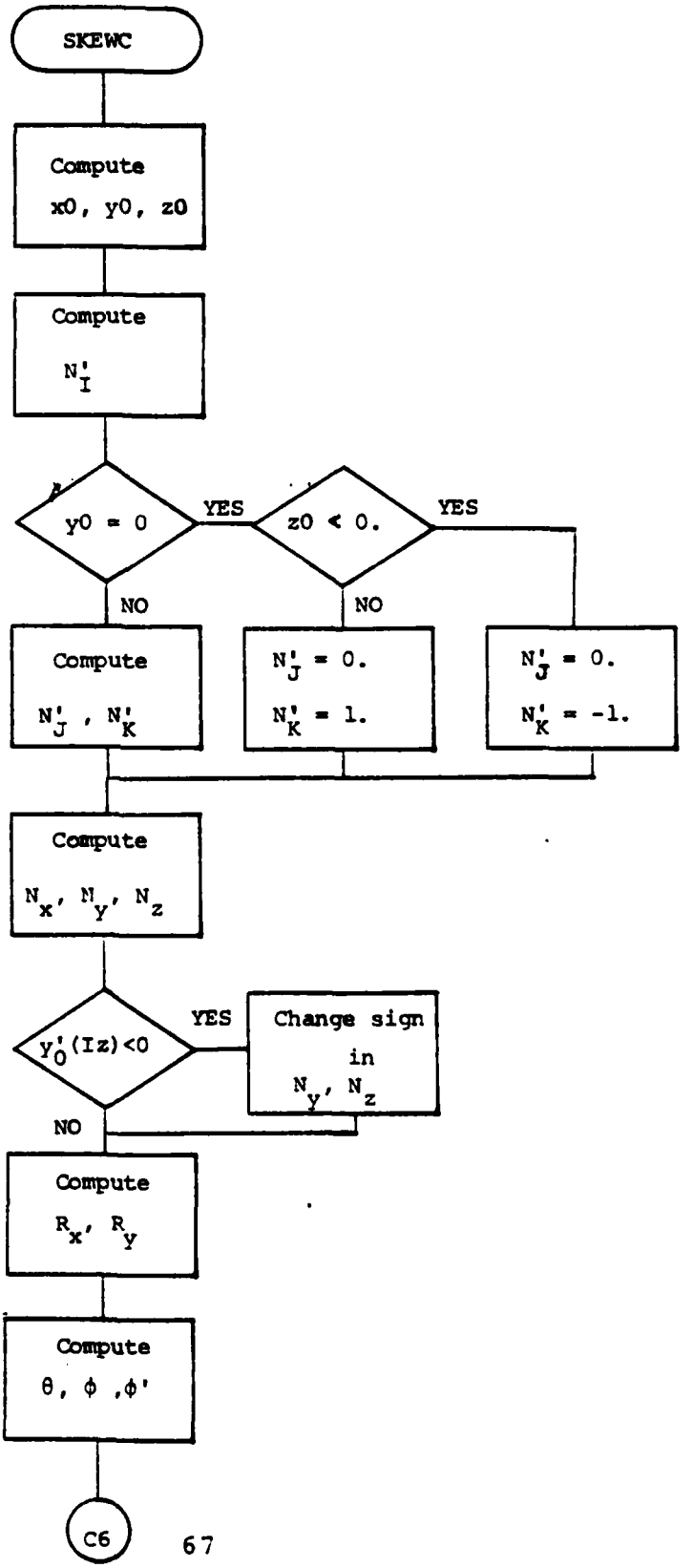

32
N = M
$y_1(N) > z_0'(Iz)$
YES
Return
NO
N = N - 1
N = 0
NO
YES
34
$z_0'(Iz) = 0$
$y_0'(Iz) < 0$
YES
35
NO
change
$y_0'(Iz)$
20

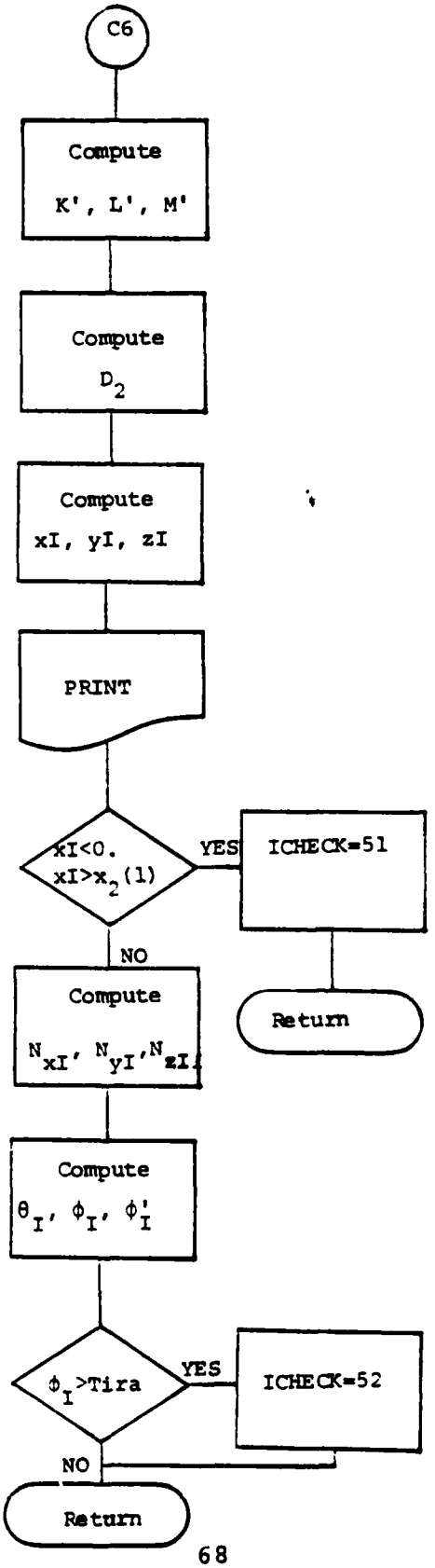

35
change
$y_0'(Iz)$
20

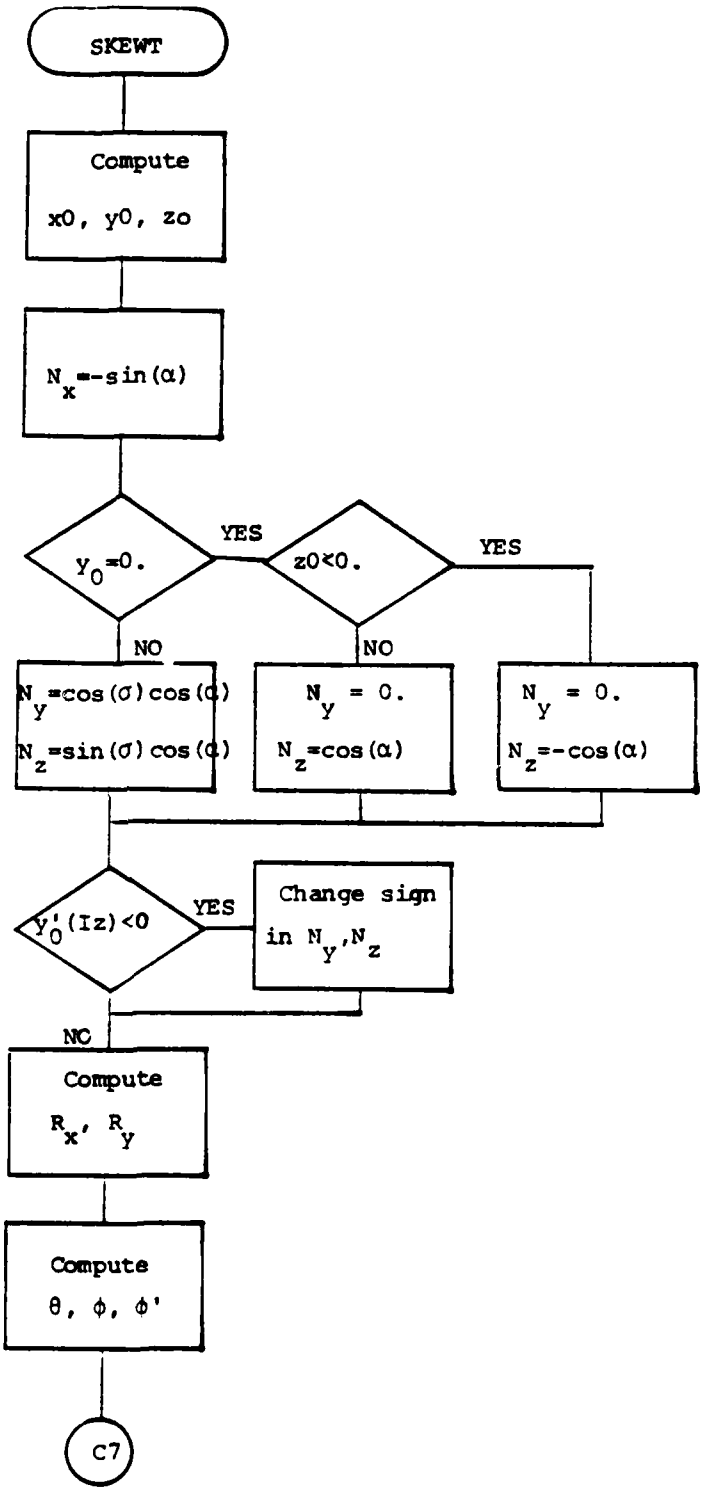

RADI
ICASE=1
YES
NO
$yR_n = y_2(N)$
$yR_1 = y_2(1)$
$yR_n = y_1(N)$
$yR_1 = y_1(1)$
Compute
R = Radius
Compute
R = Radius
$yR_n > R$
YES
ICHECK = 40
NO
Return
$R > yR_1$
YES
NO
N = N - 1
N = N - 1
YES
N > 0
NO
C5

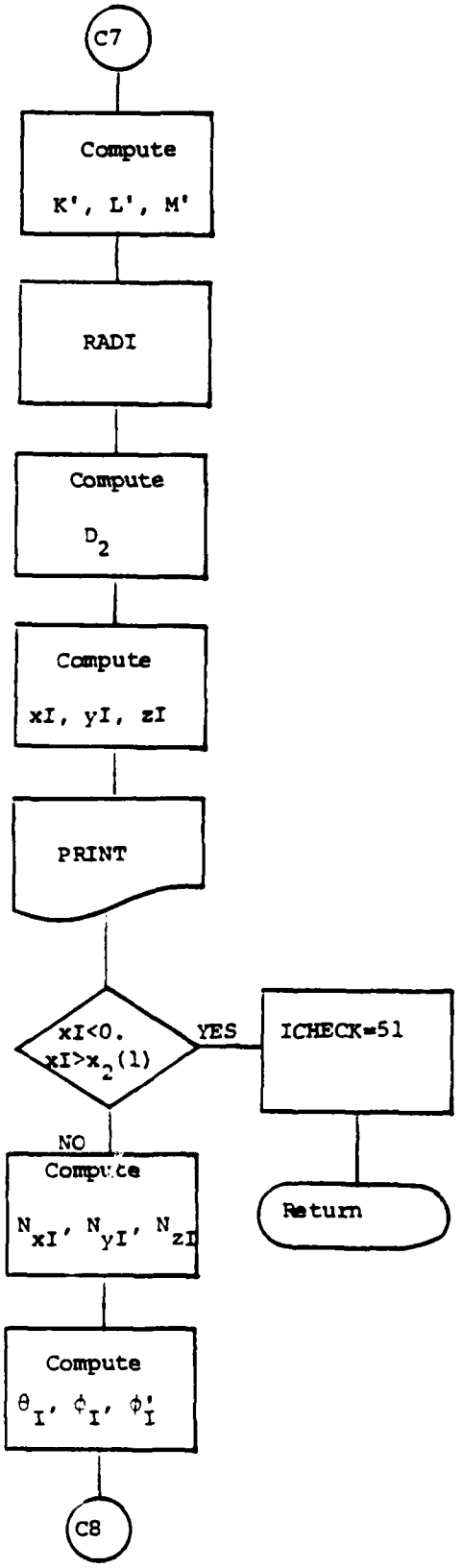

C5
Compute
Cen, Torb
$z_0'(Iz) = 0.$
$y_0'(Iz) \geq 0.$
YES
38
NO
Change
$y_0'(Iz)$
Compute
Bot
$y_0'(Iz) < Bot$
YES
ICHECK=60
NO
ICHECK=20
Return

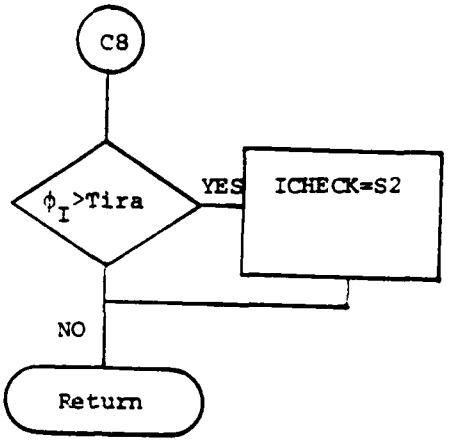

38
Change
$y_0'(Iz)$
Compute
Top
$y_0'(Iz)$
> Top
YES
Change
$y_0'(Iz)$
NO
ICHECK=20
Return

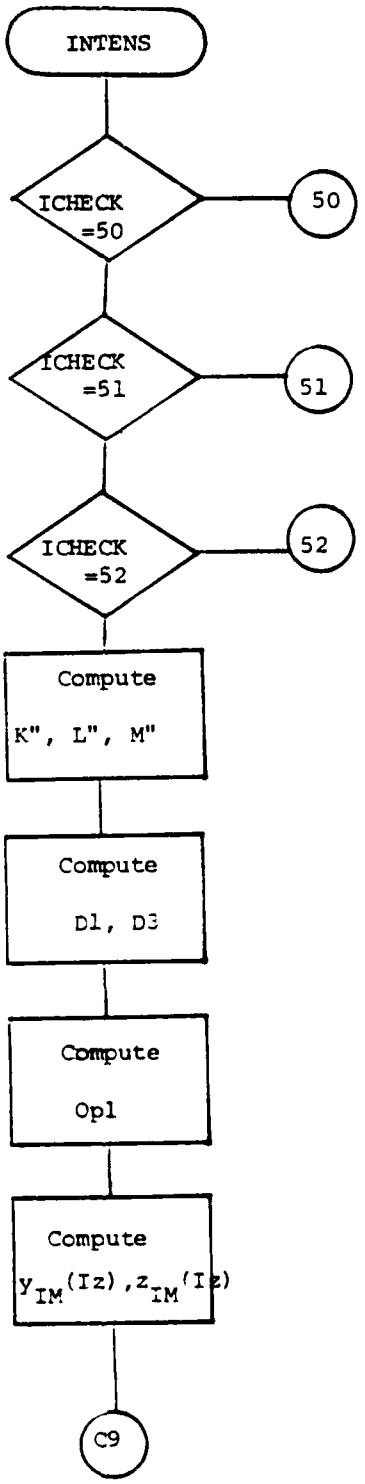

SKEWC
Compute
x0, y0, z0
Compute
$N'_I$
y0 = 0
YES
z0 < 0.
YES
NO
NO
Compute
$N'_J$ , $N'_K$
$N'_J$ = 0.
$N'_K$ = 1.
$N'_J$ = 0.
$N'_K$ = -1.
Compute
$N_x$, $N_y$, $N_z$
$y'_0(Iz)<0$
YES
Change sign
in
$N_y$, $N_z$
NO
Compute
$R_x$, $R_y$
Compute
θ, ϕ ,ϕ'
C6

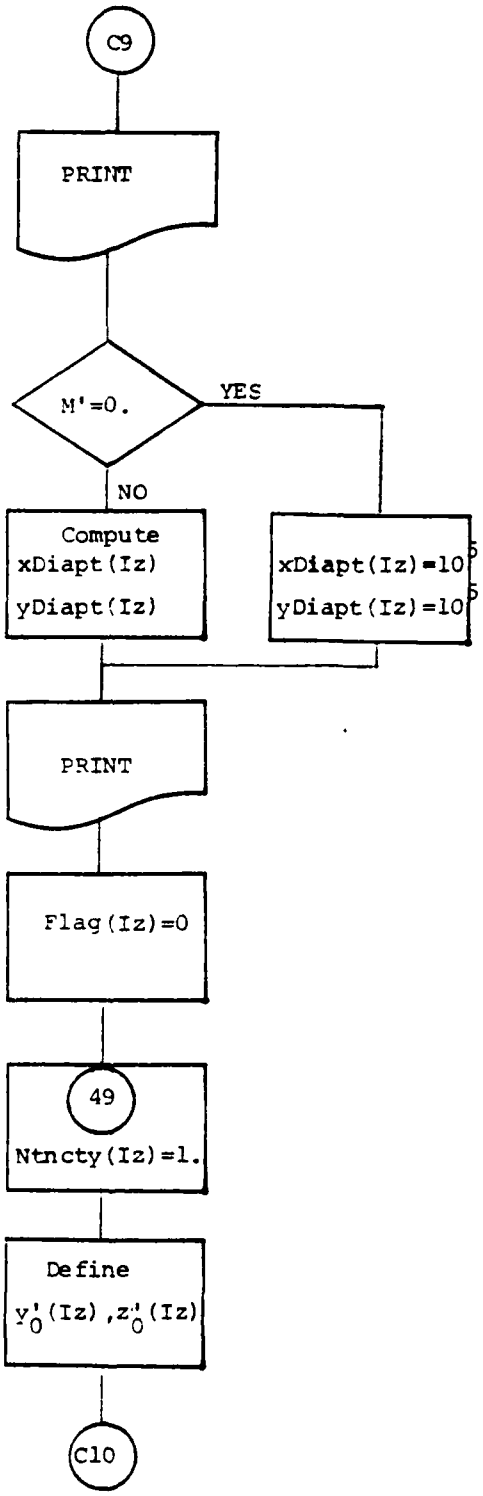

C6
Compute
K', L', M'
Compute
$D_2$
Compute
xI, yI, zI
PRINT
xI<0.
xI>$x_2$(1)
YES
ICHECK=51
Return
NO
Compute
$N_{xI}$, $N_{yI}$, $N_{zI}$
Compute
$\theta_I$, $\phi_I$, $\phi'_I$
$\phi_I$>Tira
YES
ICHECK=52
NO
Return

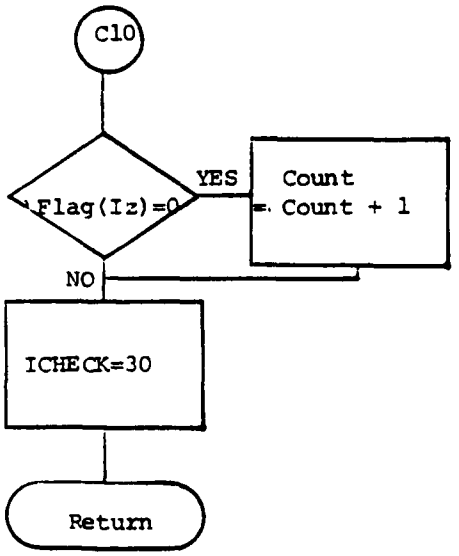

SKEWT
Compute
x0, y0, zo
$N_x$=-sin(α)
$y_0$=0.
YES
z0<0.
YES
NO
NO
$N_y$=cos(σ)cos(α)
$N_z$=sin(σ)cos(α)
$N_y$ = 0.
$N_z$=cos(α)
$N_y$ = 0.
$N_z$=-cos(α)
$y_0'$(Iz)<0
YES
Change sign
in $N_y$,$N_z$
NO
Compute
$R_x$, $R_y$
Compute
θ, φ, φ'
C7

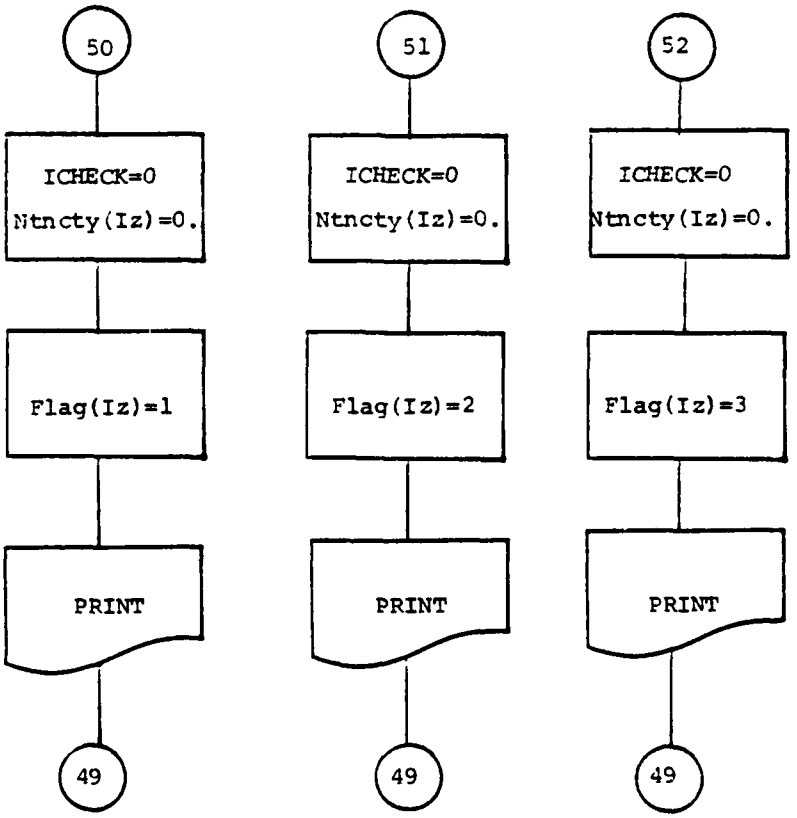

C7
Compute
K', L', M'
RADI
Compute
$D_2$
Compute
xI, yI, zI
PRINT
xI<0.
xI>$x_2$(1)
YES
ICHECK=51
Return
NO
Compute
$N_{xI}$, $N_{yI}$, $N_{zI}$
Compute
$\theta_I$, $\phi_I$, $\phi'_I$
C8


C8
$\phi_I$>Tira
YES
ICHECK=S2
NO
Return


INTENS
ICHECK =50
50
ICHECK =51
51
ICHECK =52
52
Compute K", L", M"
Compute D1, D3
Compute Opl
Compute $y_{IM}(Iz), z_{IM}(Iz)$
C9


C9
PRINT
M'=0.
YES
NO
Compute
xDiapt(Iz)
yDiapt(Iz)
xDiapt(Iz)=10^5
yDiapt(Iz)=10^5
PRINT
Flag(Iz)=0
49
Ntncty(Iz)=1.
Define
$y_0'(Iz), z_0'(Iz)$
C10


C10
Flag(Iz)=0
YES
Count
Count + 1
NO
ICHECK=30
Return


50
ICHECK=0
Ntncty(Iz)=0.
Flag(Iz)=1
PRINT
49
51
ICHECK=0
Ntncty(Iz)=0.
Flag(Iz)=2
PRINT
49
52
ICHECK=0
Ntncty(Iz)=0.
Flag(Iz)=3
PRINT
49

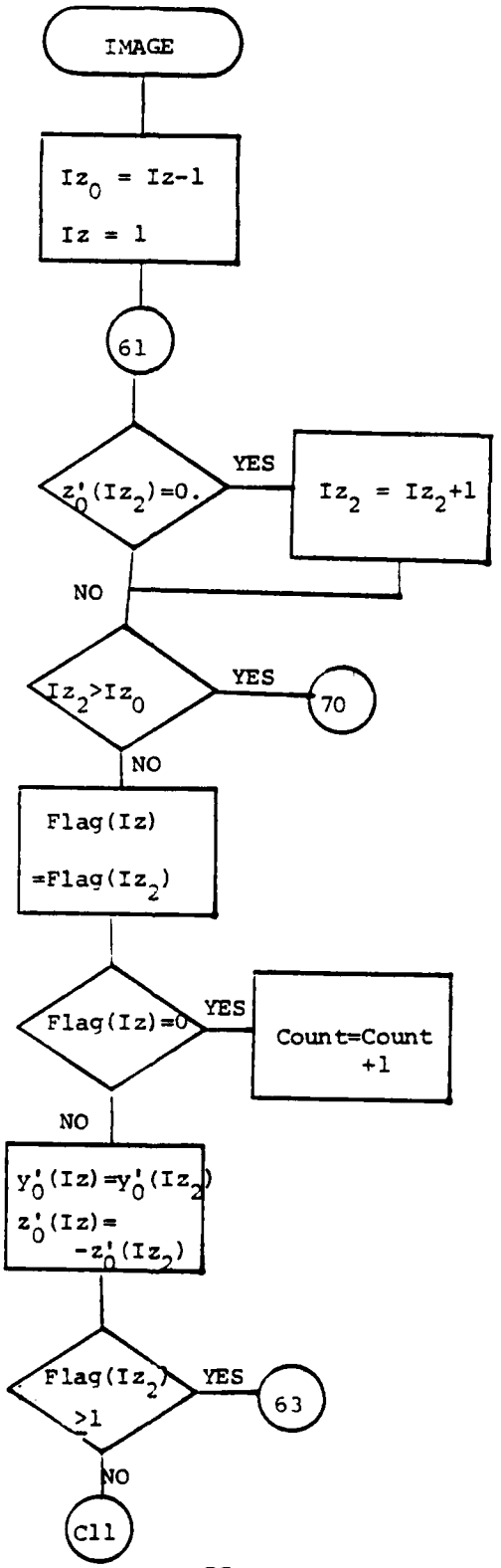
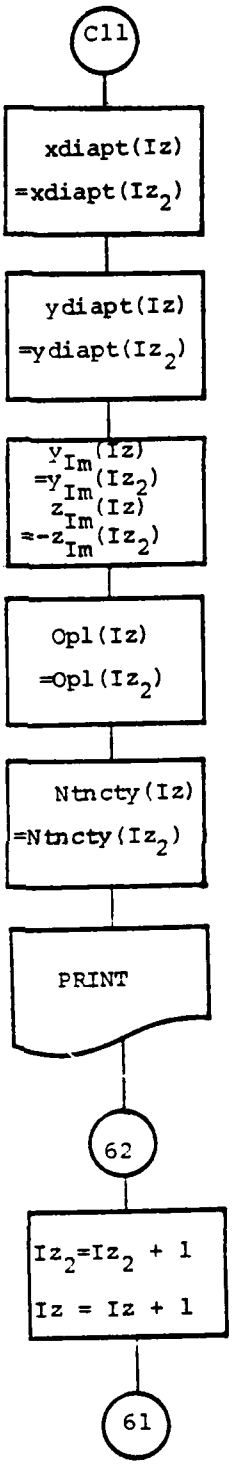
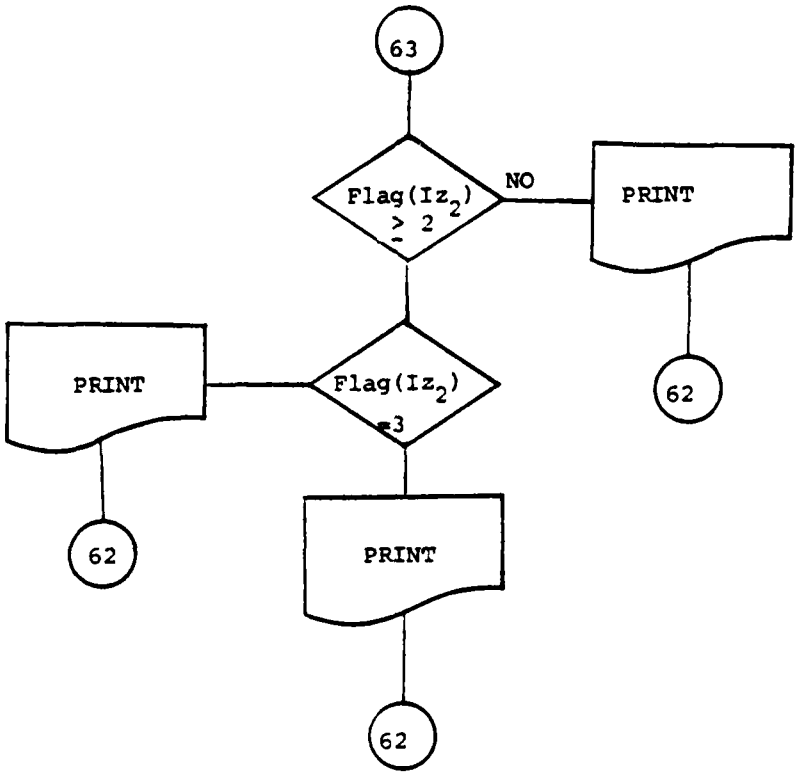
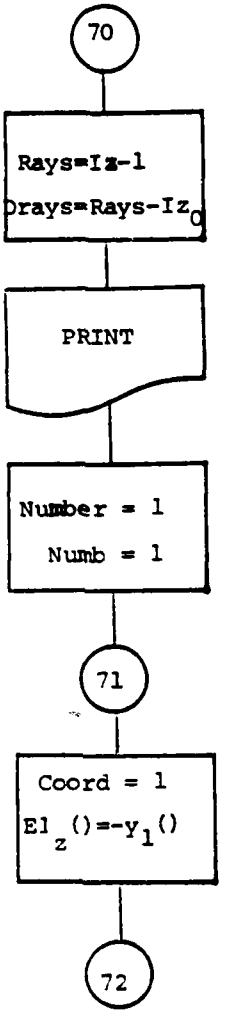
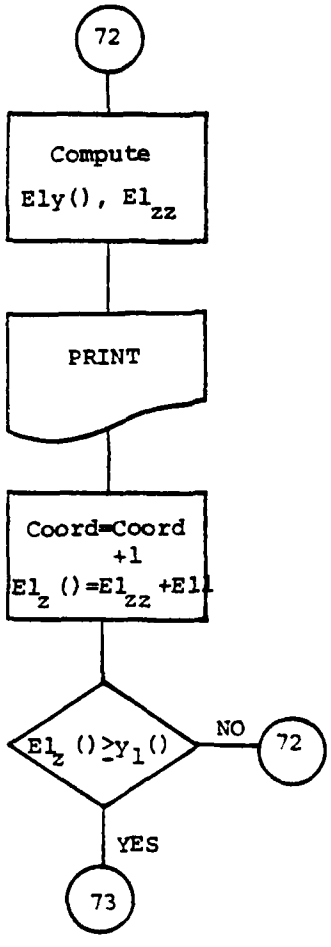


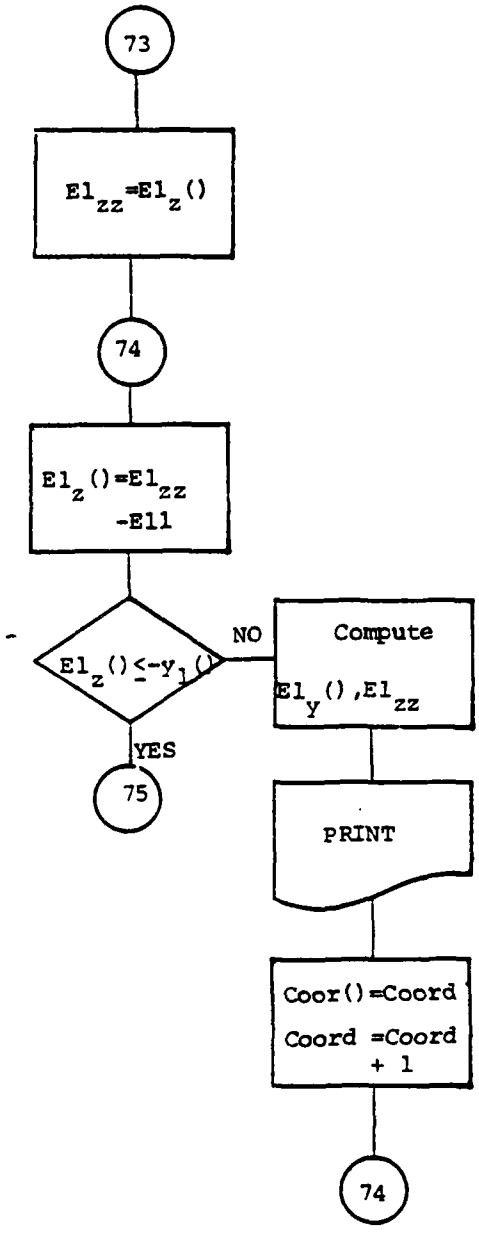
IMAGE
$Iz_0$ = Iz-1
Iz = 1
61
$z_0'(Iz_2)$=0.
YES
$Iz_2$ = $Iz_2$+1
NO
$Iz_2$>$Iz_0$
YES
70
NO
Flag(Iz)
=Flag($Iz_2$)
Flag(Iz)=0
YES
Count=Count
+1
NO
$y_0'(Iz)=y_0'(Iz_2)$
$z_0'(Iz)=$
$-z_0'(Iz_2)$
Flag($Iz_2$)
≥1
YES
63
NO
C11

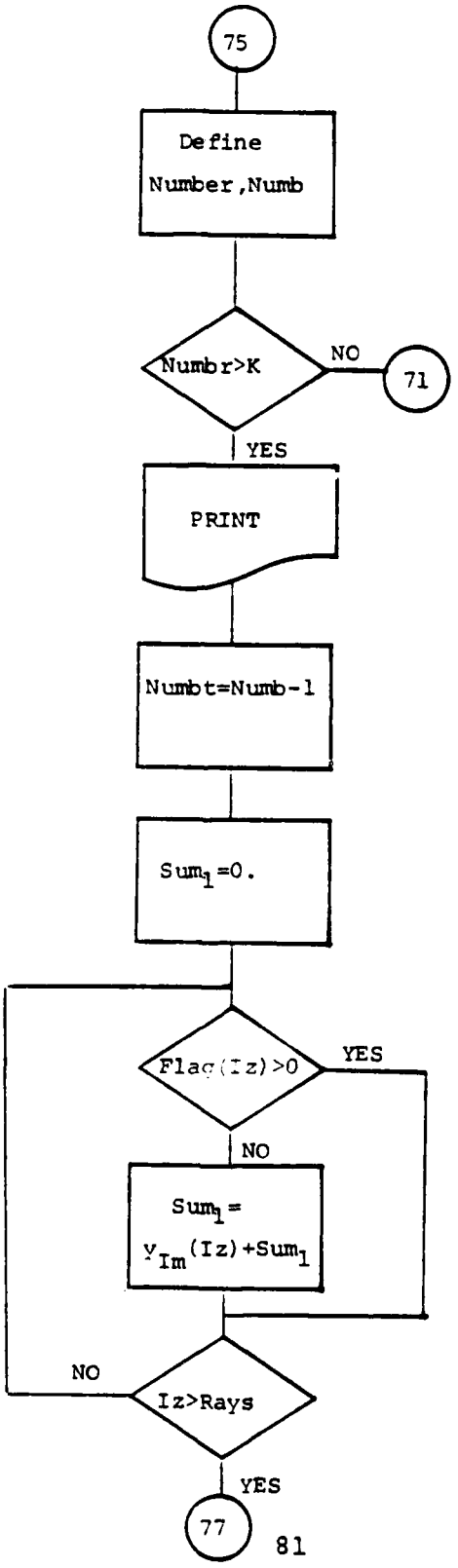

C11
xdiapt(Iz)
=xdiapt(Iz2)
ydiapt(Iz)
=ydiapt(Iz2)
yIm(Iz)
=yIm(Iz2)
zIm(Iz)
=-zIm(Iz2)
Opl(Iz)
=Opl(Iz2)
Ntncty(Iz)
=Ntncty(Iz2)
PRINT
62
Iz2=Iz2 + 1
Iz = Iz + 1
61

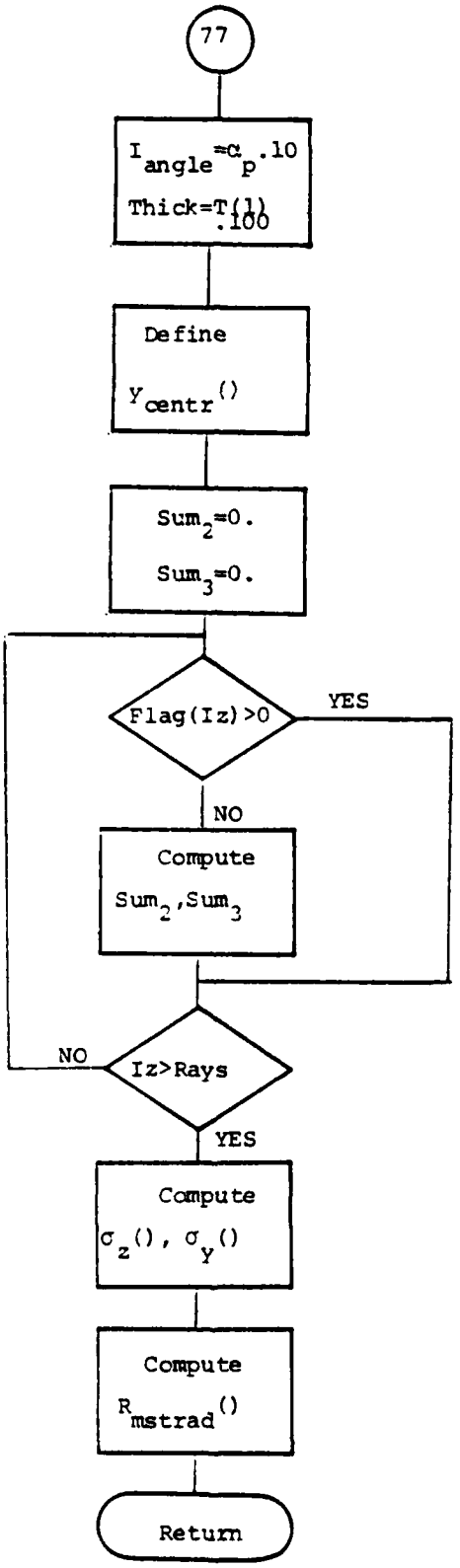

63
Flag(Iz2) ≥ 2
NO
PRINT
62
Flag(Iz2) =3
PRINT
62
PRINT
62

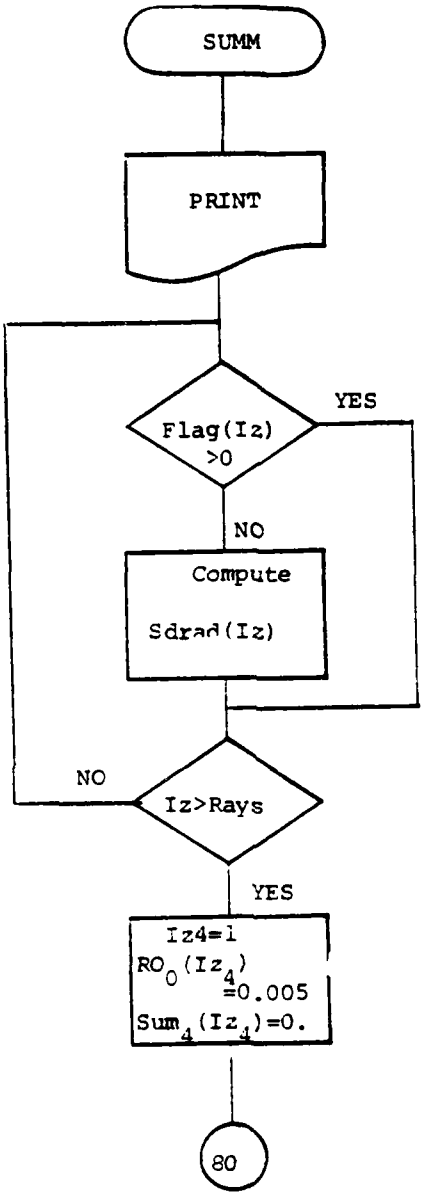

70
Rays=Iz-1
Drays=Rays-Iz0
PRINT
Number = 1
Numb = 1
71
Coord = 1
El z()=-y1()
72

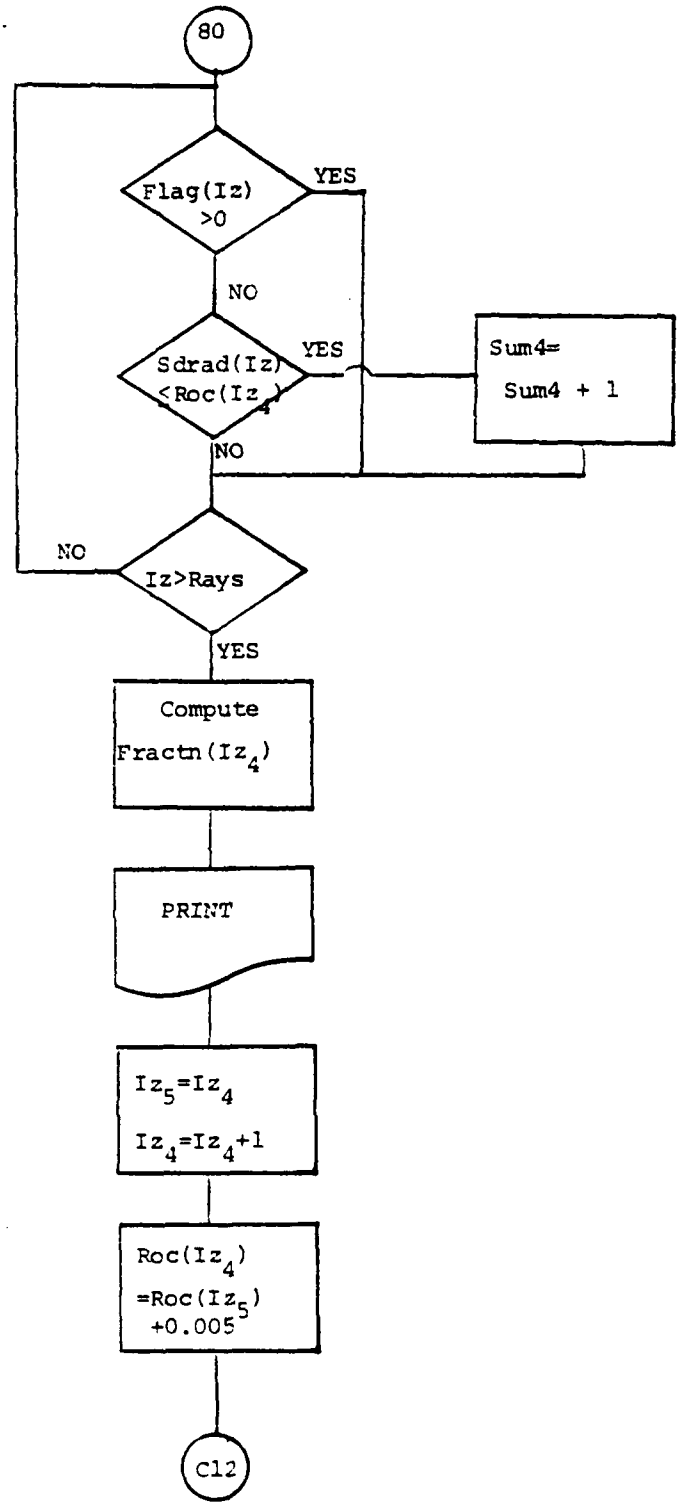

72
Compute
Ely(), El$_{zz}$
PRINT
Coord=Coord
+1
El$_z$ ()=El$_{zz}$ +El
El$_z$ ()≥y$_1$()
NO
72
YES
73

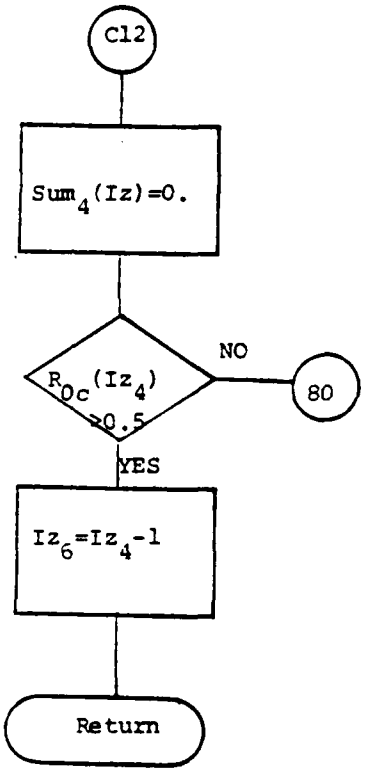

73
$El_{zz}=El_z()$
74
$El_z()=El_{zz}$
-El1
$El_z() \leq -y_1()$
NO
Compute
$El_y(), El_{zz}$
YES
75
PRINT
Coor()=Coord
Coord =Coord
+ 1
74

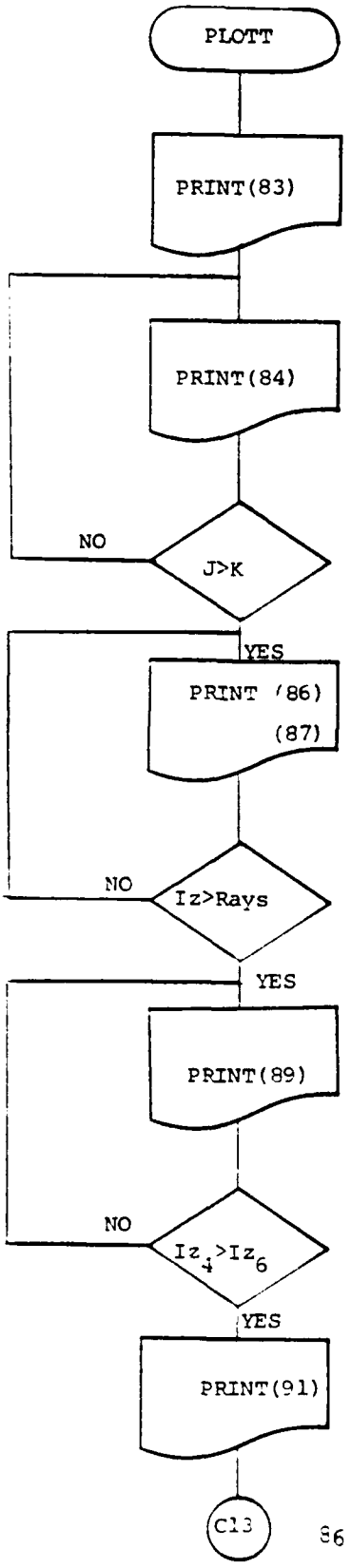

75
Define
Number,Numb
Numbr>K
NO
71
YES
PRINT
Numbt=Numb-1
Sum1=0.
Flag(Iz)>0
YES
NO
Sum1 =
YIm(Iz)+Sum1
NO
Iz>Rays
YES
77

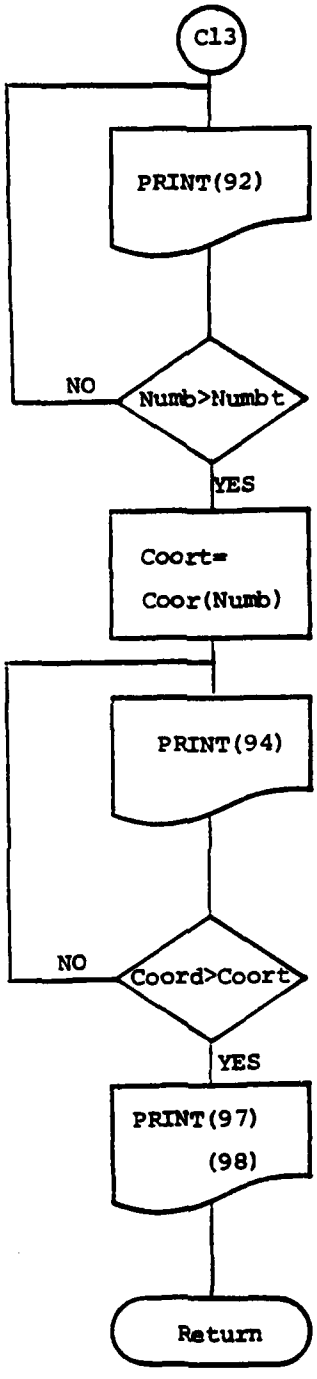

77
$I_{angle}=\alpha_p.10$
Thick=T(1).100
Define
$Y_{centr}()$
$Sum_2=0.$
$Sum_3=0.$
Flag(Iz)>0
YES
NO
Compute
$Sum_2, Sum_3$
Iz>Rays
NO
YES
Compute
$\sigma_z(), \sigma_y()$
Compute
$R_{mstrad}()$
Return


SUMM
PRINT
Flag(Iz)
>0
YES
NO
Compute
Sdrad(Iz)
NO
Iz>Rays
YES
Iz4=1
RO0(Iz4)
=0.005
Sum4(Iz4)=0.
80


80
Flag(Iz) >0
YES
NO
Sdrad(Iz) <Roc(Iz4)
YES
Sum4= Sum4 + 1
NO
Iz>Rays
NO
YES
Compute Fractn(Iz4)
PRINT
Iz5=Iz4
Iz4=Iz4+1
Roc(Iz4) =Roc(Iz5) +0.005
C12


C12
Sum4(Iz)=0.
ROc(Iz4)
>0.5
NO
80
YES
Iz6=Iz4-1
Return


PLOTT
PRINT(83)
PRINT(84)
NO
J>K
YES
PRINT (86)
(87)
NO
Iz>Rays
YES
PRINT(89)
NO
$Iz_4 > Iz_6$
YES
PRINT(91)
C13

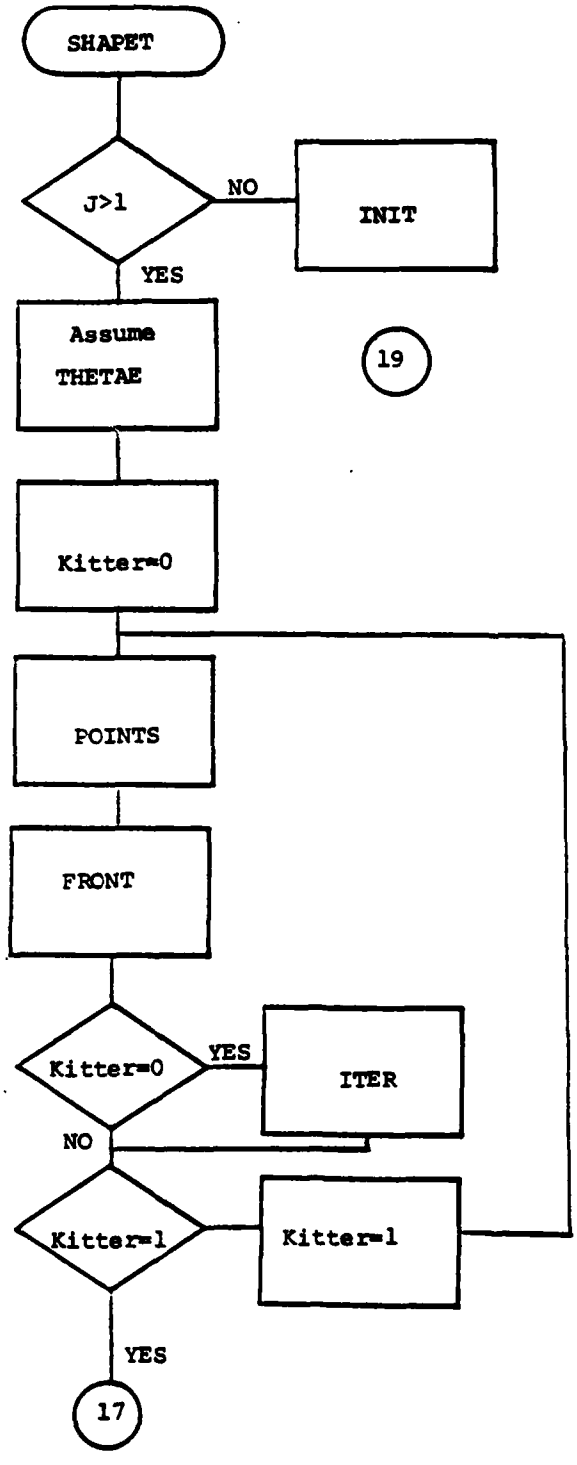

C13
PRINT(92)
NO
Numb>Numbt
YES
Coort=
Coor(Numb)
PRINT(94)
NO
Coord>Coort
YES
PRINT(97)
(98)
Return

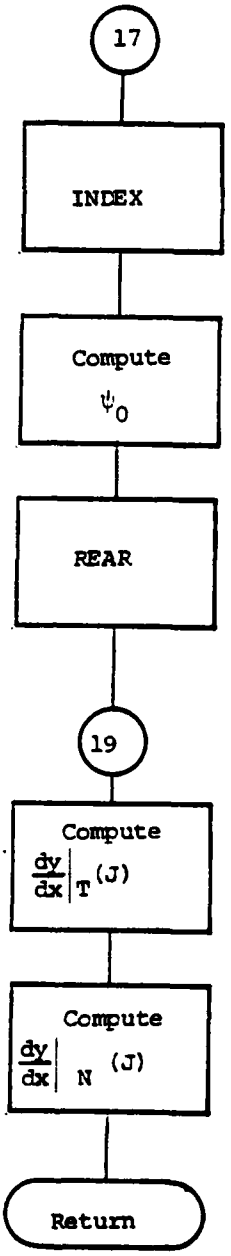
## 6. FLOW CHART OF PROGRAM GRIN

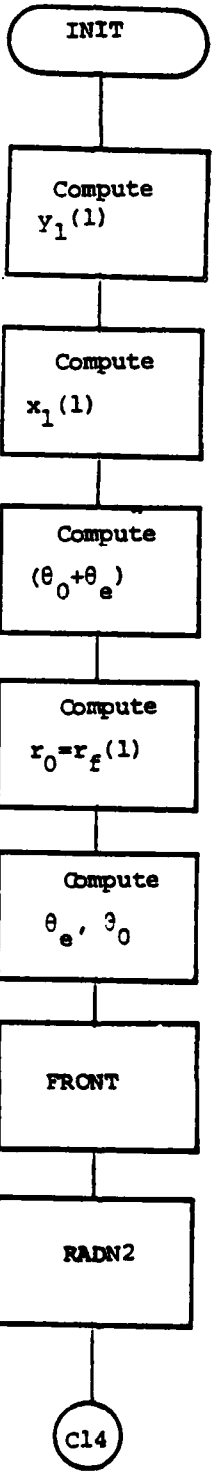
Note: Program GRIN is identical to program LENS (Section 5) except for subroutines:

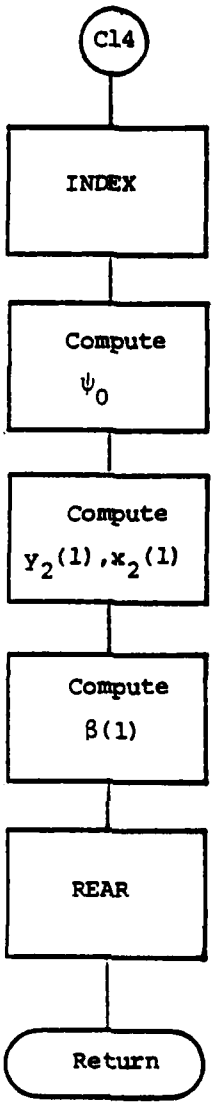
SHAPET, SKEWT, SHAPEC, SKEWC.

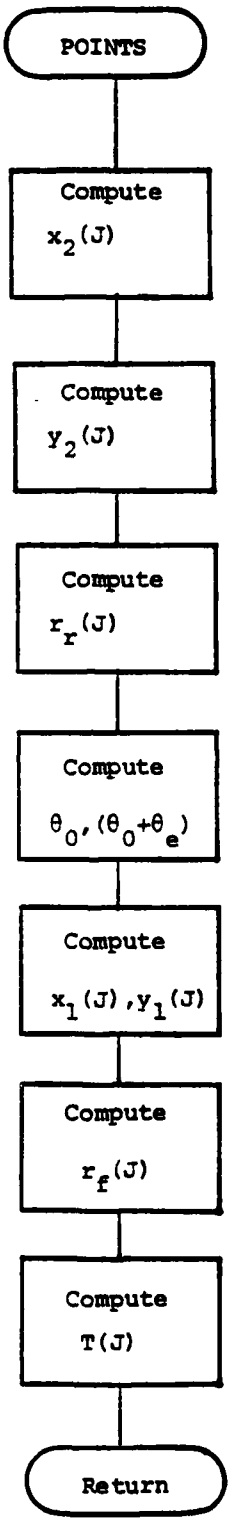
The flow chart for the first two is listed below. Subroutines SHAPEC, SKEWC are of a different design (fixed cone $\alpha_p$ for the rear surface). They are part of Captain Carr's thesis [15], and they will be described there.

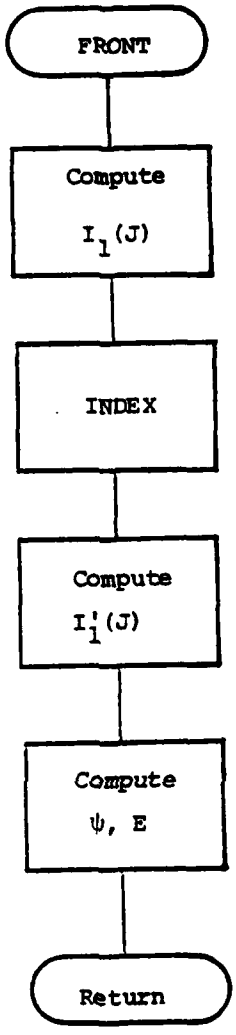

SHAPET
J>1
NO
INIT
YES
Assume
THETAE
19
Kitter=0
POINTS
FRONT
Kitter=0
YES
ITER
NO
Kitter=1
Kitter=1
YES
17

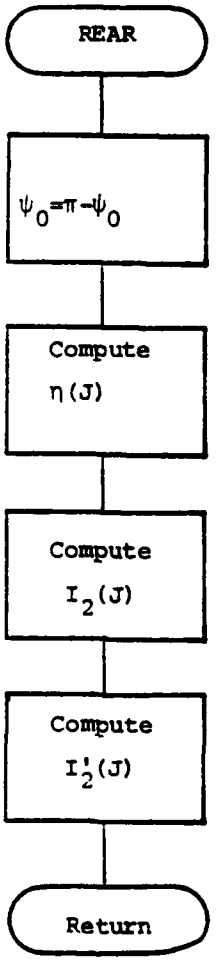

17
INDEX
Compute
$\psi_0$
REAR
19
Compute
$\left.\frac{dy}{dx}\right|_T (J)$
Compute
$\left.\frac{dy}{dx}\right|_N (J)$
Return

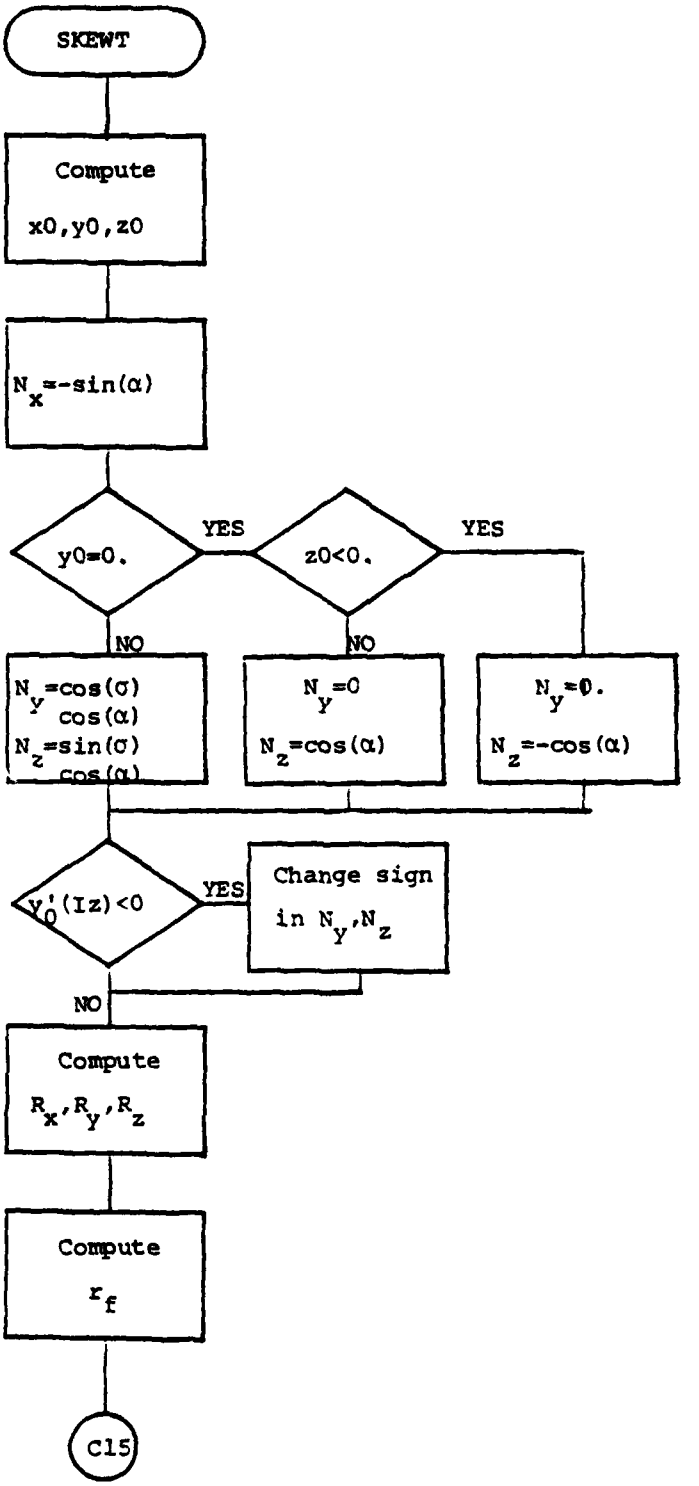

INIT
Compute $y_1(1)$
Compute $x_1(1)$
Compute $(\theta_0+\theta_e)$
Compute $r_0=r_f(1)$
Compute $\theta_e$, $\vartheta_0$
FRONT
RADN2
C14

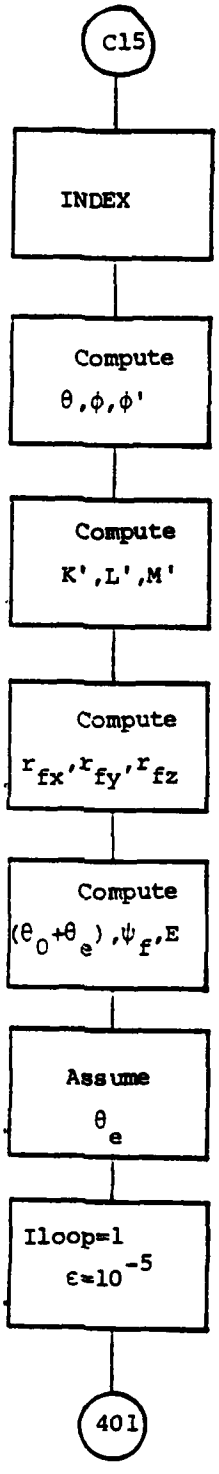

C14
INDEX
Compute
$\psi_0$
Compute
$y_2(1), x_2(1)$
Compute
$\beta(1)$
REAR
Return

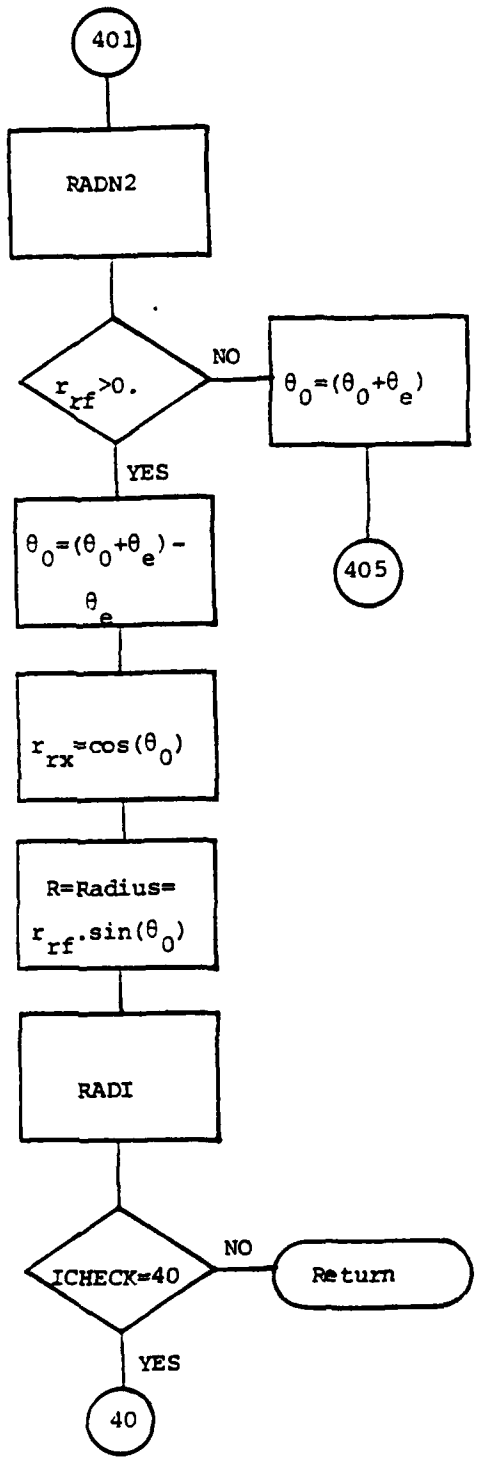

POINTS
Compute $x_2(J)$
Compute $y_2(J)$
Compute $r_r(J)$
Compute $\theta_0, (\theta_0+\theta_e)$
Compute $x_1(J), y_1(J)$
Compute $r_f(J)$
Compute T(J)
Return

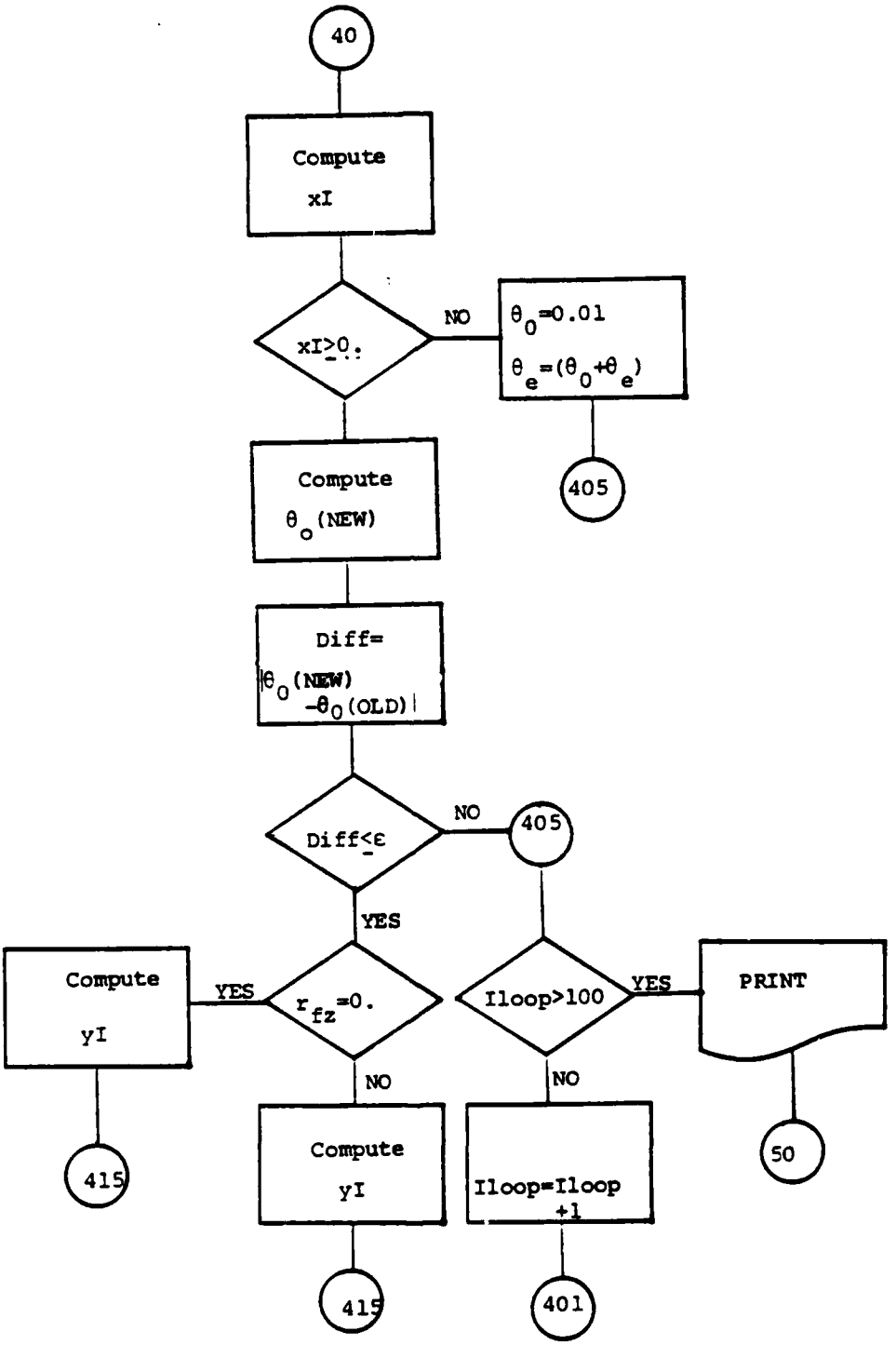

FRONT
Compute
$I_1(J)$
INDEX
Compute
$I_1'(J)$
Compute
$\psi$, E
Return

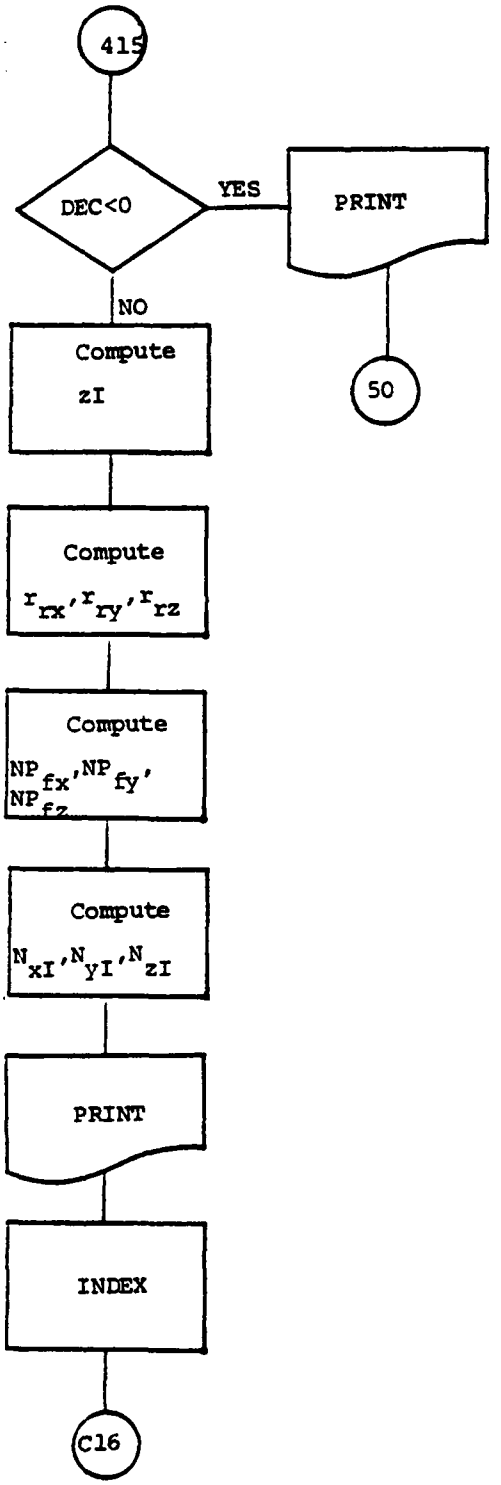

REAR
$\psi_0 = \pi - \psi_0$
Compute
$\eta(J)$
Compute
$I_2(J)$
Compute
$I_2'(J)$
Return

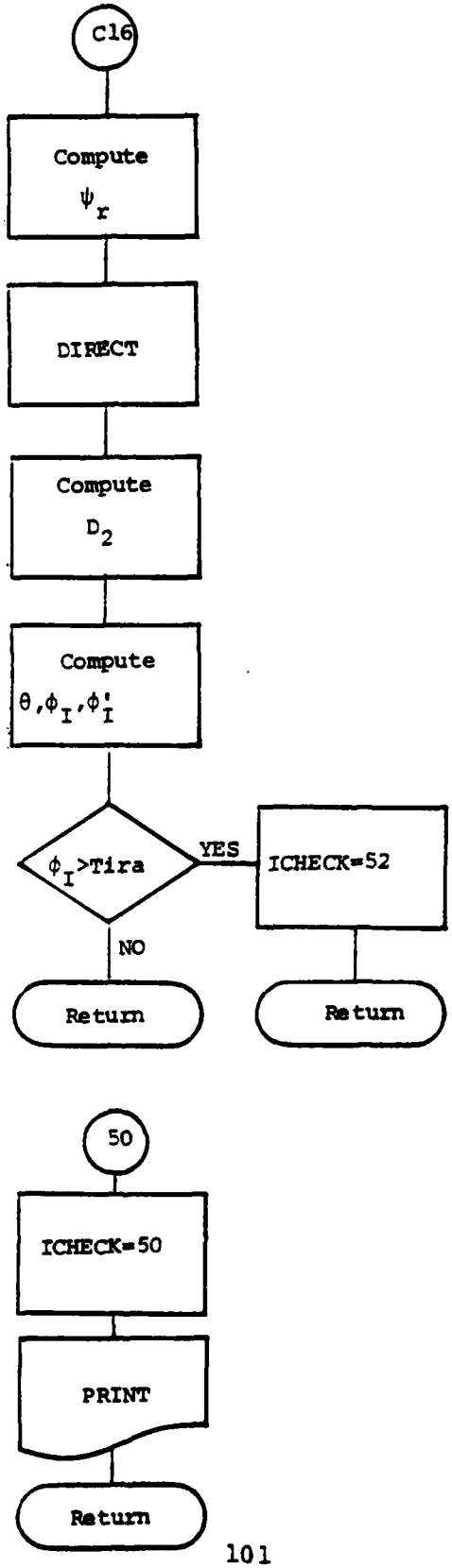

SKEWT
Compute
x0,y0,z0
$N_x$=-sin(α)
y0=0.
YES
z0<0.
YES
NO
NO
$N_y$=cos(σ) cos(α)
$N_z$=sin(σ) cos(α)
$N_y$=0
$N_z$=cos(α)
$N_y$=0.
$N_z$=-cos(α)
$y_0'$(Iz)<0
YES
Change sign in $N_y$,$N_z$
NO
Compute
$R_x$,$R_y$,$R_z$
Compute
$r_f$
C15

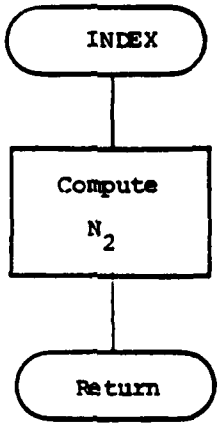

C15
INDEX
Compute
θ,ϕ,ϕ'
Compute
K',L',M'
Compute
$r_{fx}, r_{fy}, r_{fz}$
Compute
$(\theta_0+\theta_e), \psi_f, E$
Assume
$\theta_e$
Iloop=1
$\epsilon=10^{-5}$
401

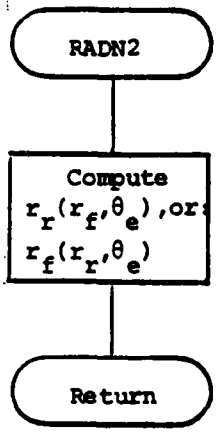

401
RADN2
$r_{rf}>0.$
NO
$\theta_0=(\theta_0+\theta_e)$
YES
405
$\theta_0=(\theta_0+\theta_e)-\theta_e$
$r_{rx}=\cos(\theta_0)$
R=Radius=
$r_{rf}.\sin(\theta_0)$
RADI
ICHECK=40
NO
Return
YES
40

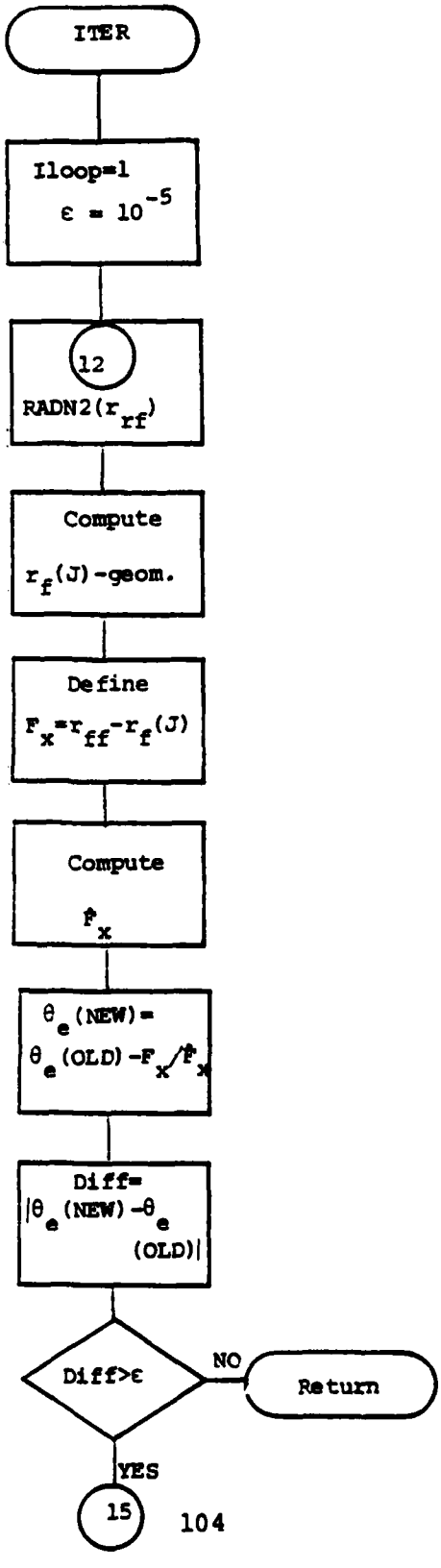

40
Compute xI
xI≥0.
NO
$\theta_0$=0.01
$\theta_e$=($\theta_0$+$\theta_e$)
405
Compute $\theta_o$(NEW)
Diff= |$\theta_0$(NEW) -$\theta_0$(OLD)|
Diff≤ε
NO
405
YES
Compute yI
YES
$r_{fz}$=0.
Iloop>100
YES
PRINT
NO
NO
415
Compute yI
Iloop=Iloop +1
50
415
401

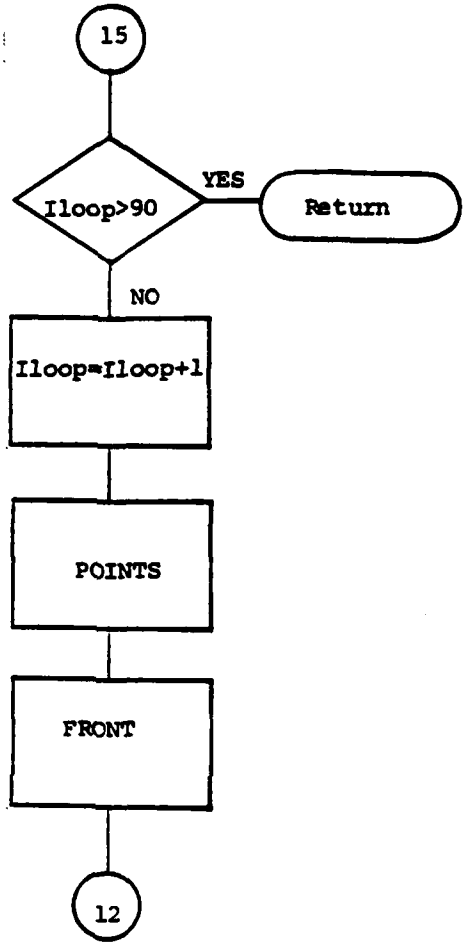

415
DEC<0
YES
PRINT
NO
Compute
zI
50
Compute
$r_{rx}, r_{ry}, r_{rz}$
Compute
$NP_{fx}, NP_{fy}, NP_{fz}$
Compute
$N_{xI}, N_{yI}, N_{zI}$
PRINT
INDEX
C16

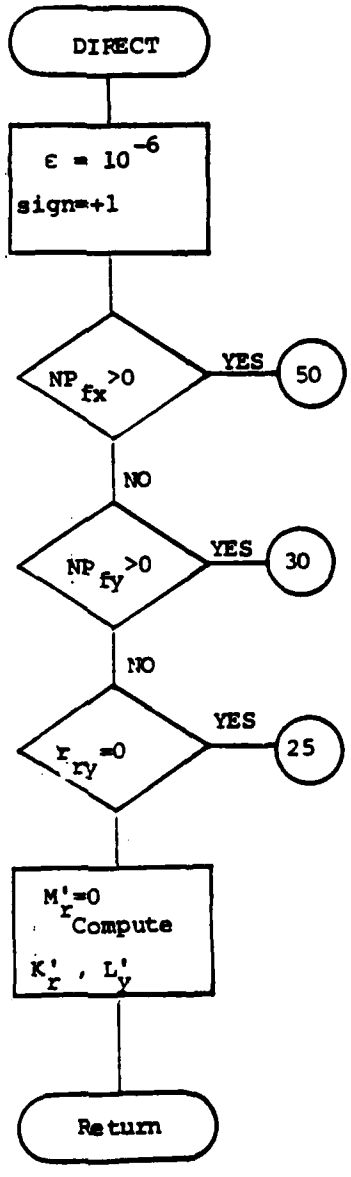

C16
Compute $\psi_r$
DIRECT
Compute $D_2$
Compute $\theta, \phi_I, \phi'_I$
$\phi_I$>Tira
YES
ICHECK=52
NO
Return
Return
50
ICHECK=50
PRINT
Return

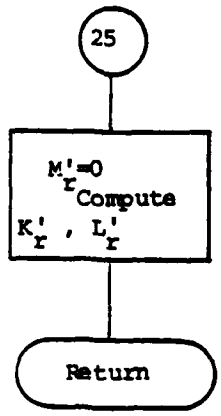

INDEX
Compute
$N_2$
Return

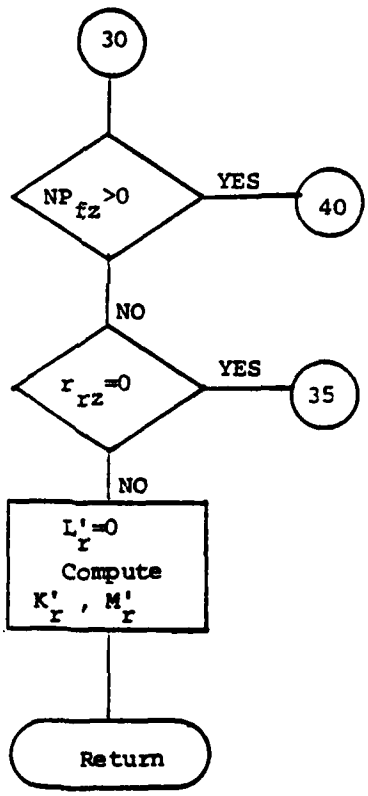

RADN2
Compute
$r_r(r_f,\theta_e)$,or
$r_f(r_r,\theta_e)$
Return

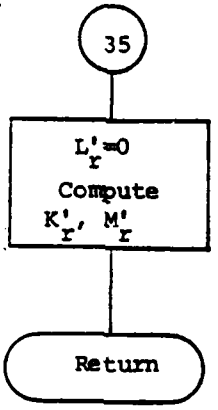

ITER
Iloop=1
ε = 10^-5
12
RADN2(r_rf)
Compute
r_f(J)-geom.
Define
F_x=r_ff-r_f(J)
Compute
f'_x
θ_e(NEW)=
θ_e(OLD)-F_x/f'_x
Diff=
|θ_e(NEW)-θ_e
(OLD)|
Diff>ε
NO
Return
YES
15

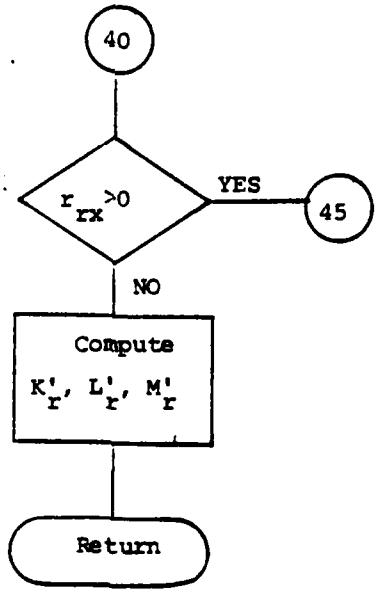

15
Iloop>90
YES
Return
NO
Iloop=Iloop+1
POINTS
FRONT
12

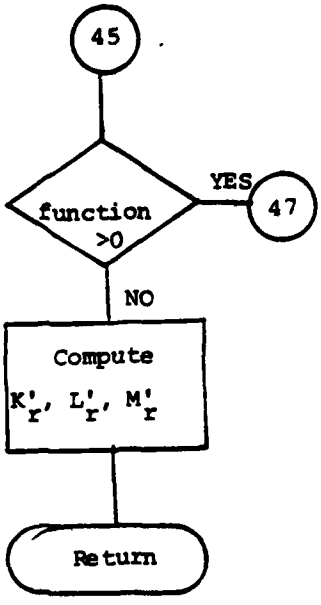

DIRECT
ε = 10^-6
sign=+1
NP_fx>0
YES
50
NO
NP_fy>0
YES
30
NO
r_ry=0
YES
25
M'_r=0
Compute
K'_r , L'_y
Return

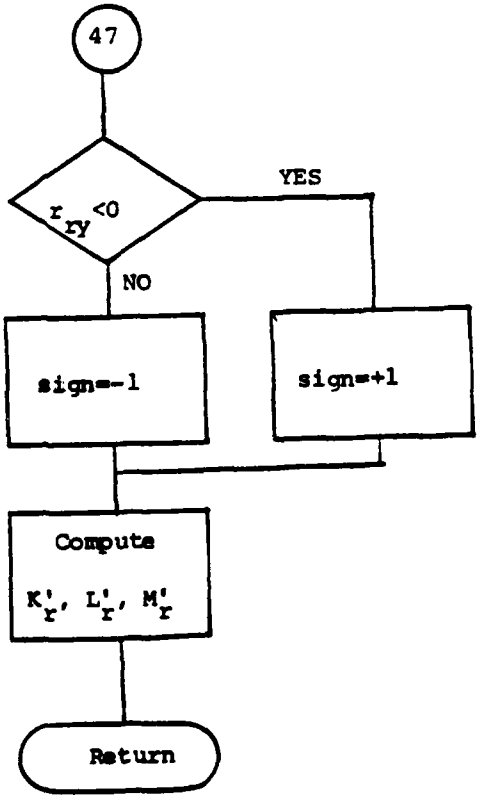

25
$M'_r=0$
Compute
$K'_r$ , $L'_r$
Return

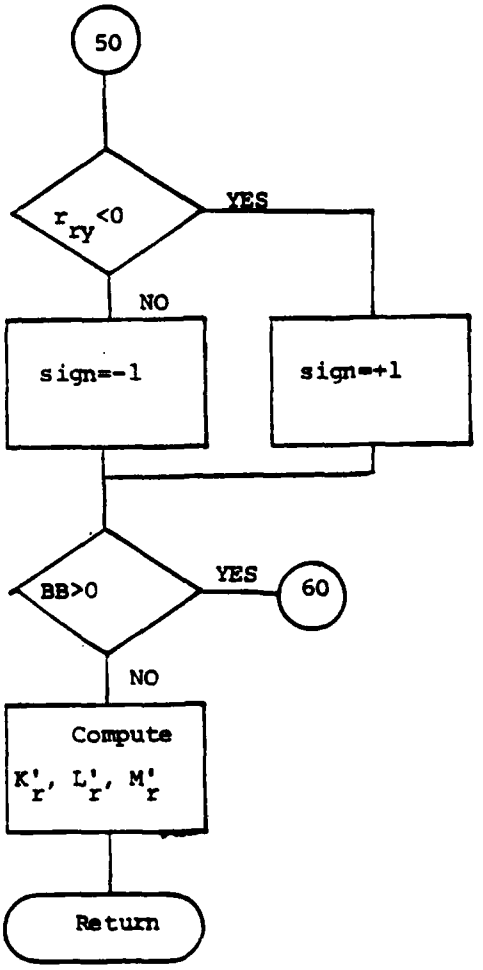

30
$NP_{fz}>0$
YES
40
NO
$r_{rz}=0$
YES
35
NO
$L'_r=0$
Compute
$K'_r$ , $M'_r$
Return

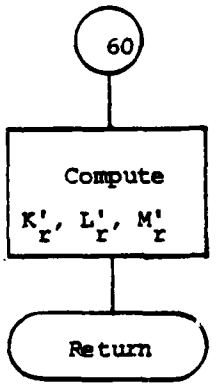

35
$L'_r=0$
Compute
$K'_r$, $M'_r$
Return


40
$r_{rx}>0$
YES
45
NO
Compute
$K'_r$, $L'_r$, $M'_r$
Return


45
function >0
YES
47
NO
Compute
$K'_r$, $L'_r$, $M'_r$
Return


47
$r_{xy}$<0
YES
NO
sign=-1
sign=+1
Compute
$K'_r$, $L'_r$, $M'_r$
Return


50
$r_{ry}$<0
YES
NO
sign=-1
sign=+1
BB>0
YES
60
NO
Compute
$K'_r$, $L'_r$, $M'_r$
Return


60
Compute
$K'_r$, $L'_r$, $M'_r$
Return

# 7. COMPUTER PROGRAMS USER'S GUIDE

## 7.1 Input Data

F, α, U, $I_{case}$

I, R, T(1)

$N_1$, $N_2$, $N_3$

$\alpha_p$, Grid, Ellnum

$X_C$, Div

Shape, Squray, Ellips

## 7.2 Options

$I_{case}$=1 Rear surface is a fixed cone
(Capt. Carr's thesis, see ref. [15])

$I_{case}$=2 Front surface is a fixed cone
(This report).

## 7.3 Execution Commands

### 7.3.1 Opening Commands

LΔXXXX (Write account no. instead of XXXX).

Password

GLOBAL TXTLIB FORTMOD2 MOD2EEH

### 7.3.2 Compilation

FORTGI LENS (or GRIN)

### 7.3.3 Run on Terminal (WORKG(1))

FILEDEF 05 DISK DATA L

FILEDEF 06 DISK OUT D (RECFM F BLOCK 132 PERM

EXEC RUN LENS (or GRIN)

XEDIT OUT D

7.3.4 Hard Copy

FILE

PRINT OUT D

7.3.5 Get a Plot

LENSCOM PRINTER

7.3.6 Change in Plot Routine

XEDIT LENSPLOT FORTRAN

7.3.7 Transfer Files to Another User

(a) **The Transferer**

CP SPOOL PUNCH CONT TO XXXXP(2)

PUNCH LENS FORTRAN(3)

(PUNCH GRIN FORTRAN(3))

(PUNCH DATA L(3))

CP SPOOL PUNCH CLOSE NOCONT

CP SPOOL PUNCH OFF

(b) The Receiver

READCARDΔ*Δ*

(c) Notes

(1) WORKG is the name of the file of the commands in this section.

(2) Account No. of the receiver.

(3) Optional.

## 8. COMPUTER PROGRAMS LIST OF SYMBOLS AND SUBROUTINES

### 8.1 Subroutines

| | |
|---|---|
| DATTA | Initial data |
| SHAPET | Computes shape of lens in $I_{case}=2$ |
| SHAPEC | Computes shape of lens in $I_{case}=1$ |
| INIT | Computes behavior of first ray. |
| POINTS | Computes coordinates of rear and front surfaces. |
| FRONT | Computes $I_1(J)$, $I_1'(J)$, $\psi$, E at front surface. |
| REAR | Computes $\eta(J)$, $I_2(J)$, $I_2'(J)$ at rear surface. |
| CALTC | Computes thickness at each point for SHAPEC. |
| NOSE | Computes extrapolation of last points in $I_{case}=1$, or coordinates shift in $I_{case}=2$. |
| ZOYO | Computes $Z_0'(IZ)$, $y_0'(IZ)$ for skew rays calculation. |
| RADI | Computes intersection of the ray with the designed surface. |
| SKEWT | Skew rays calculation in $I_{case}=2$. |
| SKEWC | Skew rays calculation in $I_{case}=1$. |
| INTENS | Calculates transmitted intensity of the rays. |
| IMAGE | Calculates image plane spot diagram. |
| SUMM | Calculates spot diagram energy density. |
| PLOTT | Save output for plot routine. |
| INDEX | Computes index of refraction in the lens ($N_2$). |
| RADN2 | Computes radius to rear (or front) surface from known radius to front (or rear) surface and $\theta_e$. |
| ITER | Iteration routine to find correct $\theta_e$ in SHAPET. |
| DIRECT | Computes direction cosines of the ray at the rear surface. |

## 8.2 Program Symbols

### 8.2.1 Data Symbols

| | |
|---|---|
| F | Focal length. |
| $\alpha$ | The fixed surface cone half angle. |
| U | The incident ray offset angle. |
| I | Number of iterations. |
| R | Maximum radius of fixed surface cone. |
| T(1) | Thickness of lens at the edge. |
| $N_1, N_2, N_3$ | Indices of refraction. |
| $\alpha_p$ | Inclination of object plane. |
| Grid | Size of grid increment. |
| Ellnum | Number of ellipses. |
| Ell | z - coordinate increment for ellipse plot. |
| $X_C$ | Location of center symmetry in GRIN. |
| Div | The maximum change in the index of refraction ($N_2$) |

### 8.2.2 Geometrical Symbols

| | |
|---|---|
| $x_1(J), y_1(J)$ | Coordinates on front surface. |
| $x_2(J), y_2(J)$ | Coordinates on rear surface. |
| $r_f(J)$ | Radius to front surface. |
| $r_r(J)$ | Radius to rear surface. |
| XO, YO, ZO | Intercept of the ray with the front surface. |
| XI, YI, ZI | Intercept of the ray with the rear surface. |
| $Y_{Im}, Z_{Im}$ | Intersection with the image plane. |

### 8.2.3 Direction Cosines Symbols

| | |
|---|---|
| $N_x, N_y, N_z$ | Direction cosines of the front surface normal. |

| | |
|---|---|
| $N_{xI}, N_{yI}, N_{zI}$ | Direction cosines of the rear surface normal. |
| $R_x, R_y, R_z$ | Direction of cosines of the ray. |
| K', L', M' | Direction cosines of the internal refracted ray. |
| $r_{fx}, r_{fy}, r_{fz}$ | Direction cosines of the front radius. |
| $NP_{fx}, NP_{fy}, NP_{fz}$ | Direction cosines of the normal to plane of the ray at front surface. |
| $r_{rx}, r_{ry}, r_{rz}$ | Direction cosines of the rear radius. |
| K", L", M" | Direction cosines of the rear surface external refracted ray. |

8.2.4 Angle Symbols

The angle symbols are defined in figures 3 and 8.

## 9. PROGRAM LENS - LISTING

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C                                                                      C
C                          PROGRAM LENS                                C
C                                                                      C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      COMMON/D1/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF
     1,ALFAP,GEID,ELLALF,FNUM,ELLBF,PI,RAD,ICASE
     2,SHAPE,SOURAY,ELLIPS,ICHECK
      COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)
      COMMON/SP/K,L,IZ,IZ1,M,N,NP1,FLAG(1000),IZ0,RAYS,IZ2,DRAYS
     1,NUMBR,COORD,NUMP,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6
     2,COOR(500),NUMET,COORT,GAMMA,AB,ONP,STATNA
     3,RAYY(1000),RAYZ(1000),CENI,TORBI,BOTI,TOPI
     4,RADIUS,CEN,TOP,BOT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA
     6,NPI,NPJ,NPK,THETA,PHI,PHIP,AO,BO,CO,OC,EC,PAR1,PAR2
     7,PAR3,XO,YO,ZO,NUP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI
     8,NUM5,CKPF,CLPF,CMPF,D3,CPL(1000),DI,NUM6,NUM7,NTNCTY(1000)
     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO
      COMMON/SP/NUMP,THETAI,XDIAPT(1000),YDIAPT(1000),SUM1
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)
     2,RCC(3000),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)
C
      INTEGER ELLNUM,EALM,SHAPE,SOURAY,ELLIPS
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT
      REAL N1,N2,N3
      REAL I1,I1P,I2,I2P
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA
      REAL NPI,NPJ,NPK,NUP,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8
     1,NTNCTY
C
      CALL DATIA
      ICHECK=0
      K=I+1
      DO 10 J=1,K
      IF(J.GT.1)BETA(J)=BETA(1)-(J-1)*DLB
      IF(ICASE.EQ.1)CALL SHAPEC
      IF(ICASE.EQ.2)CALL SHAPET
      IF(J.GT.1)GO TO 5
      DLB=BETA(1)/I
      WRITE(6,100) ICASE,ALPHA,BETA(1),R,U,I,T(1),N1,N2,N3,BF,DLB
    5    IF(SHAPE.EQ.0)GO TO 10
         WRITE(6,200)J,X1(J),Y1(J),X2(J),Y2(J),BETA(J),I2P(J),I2(J),
     1   ETA(J),T(J),I1P(J),I1(J),DYDXT(J)
   10 CONTINUE
         CALL NOSE
   20 CALL ZOYO
         IF(ICASE.GT.1)GO TO 25
         CALL RACI
         IF(ICHECK.EQ.20)GO TO 20
         IF(ICHECK.EQ.40)CALL SKEWC
         IF(ICHECK.EQ.60)GO TO 60
         GO TO 50
   25 CALL SKEWT
         IF(ICHECK.EQ.20)GO TO 20
         IF(ICHECK.EQ.60)GO TO 60
   50 CALL INTENS
         IF(ICHECK.EQ.30)GO TO 20
         STOP
   60 CALL IMAGE
      CALL SUMP
      CALL PLOT1
  100 FORMAT('1','GLP LENS PARAMETERS(',I1,'):'///5X,'ALPHA = ',F9.7,2X,
     1'BETA = ',F9.7,2X,'RADIUS = ',F7.5,2X,'INCIDENT ANGLE = ',
     1F9.6,2X,'ITERATIONS = ',I5//5X,'EDGE THICKNESS = ',F9.7,2X,
     1'INDICES OF REFRACTION: N1 = ',F7.5,2X,'N2 = ',F7.5,2X,'N3 = ',
     1F7.5//5X,'FOCAL LENGTH FROM STATION ZERO = ',F7.5,2X,
     1'DELTA BETA= ',F7.5///
     11X,'  J         X1          Y1          X2          Y2          BETA        I2P
     1          I2          ETA         EO          I1P         I1          DYDXT'//)
```

```
  200 FORMAT(1),I4,12F10.7)                                                  LEN00730
      STOP                                                                   LEN00740
      END                                                                    LEN00750
                                                                             LEN00760
      SUBROUTINE DATTA                                                       LEN00770
      COMMON/DT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF                 LEN00780
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                             LEN00790
     2,SHAPE,SCURAY,ELLIPS,ICHECK                                            LEN00800
      COMMON/SPF/I1(1010),I1P(1010),I2(1010),I2P(1010)                       LEN00810
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                         LEN00820
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                                    LEN00830
      COMMON/SP/K,L,IZ,IZ1,M,N,NP1,FLAG(1000),IZ0,RAYS,IZ2,CRAYS             LEN00840
     1,ALMBR,CCORD,NUMB,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                       LEN00850
     2,CCCR(500),NUMBT,COORT,GAMMA,AB,ONP,STATNA                             LEN00860
     3,RAYY(1000),RAYZ(1000),CENI,TCRBI,BOTI,TOPI                            LEN00870
     4,RADIUS,CEN,TCP,ECT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP              LEN00880
     5,AX,NY,AZ,RX,RY,RZ,AXI,NYI,NZI,PHII,PHIIP,TIRA                         LEN00890
     6,APJ,NPJ,APK,THETA,PHI,PHIP,A0,B0,C0,DC,E0,PAR1,PAR2                   LEN00900
     7,PAR3,XC,YC,ZC,NLP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI         LEN00910
     8,NUM5,CKPP,CLPP,CMPP,D3,GPL(1000),D1,NUM6,NUM7,NTNCTY(1000)            LEN00920
     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYD             LEN00930
      COMMON/SP/NUMB,THETAI,XD(APT(1000),YD(APT(1000),SUM1                   LEN00940
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)                LEN00950
     2,RCC(350),SUM4(350),FRACTN(300),SORAD(1000),YCENTR(20,500)             LEN00960
C                                                                            LEN00970
      INTEGER ELLNUM,ENUM,SHAPE,SCURAY,ELLIPS                                LEN00980
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOP,COORT                   LEN00990
      REAL N1,N2,N3                                                          LEN01000
      REAL I1,I1P,I2,I2P                                                     LEN01010
     1,AX,NY,AZ,RX,RY,RZ,AXI,NYI,NZI,PHII,PHIIP,TIRA                         LEN01020
      REAL NPJ,APJ,APK,AUP,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8           LEN01030
     1,NTNCTY                                                                LEN01040
C                                                                            LEN01050
C     F IS THE FOCAL LENGTH                                                  LEN01060
C     ALPHA IS THE INSIDE SURFACE CONE HALF ANGLE                            LEN01070
C        (ALFA IS IN DEG.,ALPHA IS IN RAD.)                                  LEN01080
C     U IS THE INCIDENT RAY OFFSET ANGLE                                     LEN01090
C     ICASE CHOOSES WHETHER THE CONE IS THE FRONT SURFACE(1,ICASE=1)         LEN01100
C                                    OR THE REAR SURFACE(C,ICASE=2)          LEN01110
C     I IS THE NUMBER OF ITERATIONS(MUST BE AN EVEN INTEGER)                 LEN01120
C     R IS THE MAXIMUM RADIUS OF INSIDE SURFACE CONE                         LEN01130
C     T IS THE THICKNESS OF LENS AT THE EDGE                                 LEN01140
C        (E0 IS THE NORMALIZED T)                                            LEN01150
C     N1,N2,N3 ARE THE INDICES OF REFRACTIONS                                LEN01160
      READ (5,*) F,ALFA,U,ICASE                                              LEN01170
      READ (5,*) I,R,T(1)                                                    LEN01180
      READ (5,*) N1,N2,N3                                                    LEN01190
      T(1)=T(1)/R                                                            LEN01200
      PI=ATAN(1.0)*4.0                                                       LEN01210
      RAD=PI/180.0                                                           LEN01220
      ALPHA=ALFA*RAD                                                         LEN01230
C                                                                            LEN01240
C     INPUT KNOWNS FOR TRACE RAY:                                            LEN01250
C     ALFAP IS THE INCLINATION OF OBJECT PLANE(RADIANS)                      LEN01260
C     GRID IS THE SIZE OF GRID INCREMENT                                     LEN01270
C     ELLNUM :  THE NUMBER OF ELLIPSES=ENUM;ELLNUM MUST BE EVEN             LEN01280
C               AND 1/ELLNUM MUST BE AN INTEGER WITH NO REMAINDER            LEN01290
C     ELL IS THE Z COORDINATE INCREMENT FOR ELLIPSE PLOTS                    LEN01300
      READ (5,*) ALFAP,GRID,ELLNUM                                           LEN01310
      ENUM=ELLNUM+1                                                          LEN01320
      ELL=GRID/5.0                                                           LEN01330
      BF=F/R                                                                 LEN01340
C                                                                            LEN01350
C     INPUT FOR GRID(NOT IN USE HERE)                                        LEN01360
      READ(5,*)XC,DIV                                                        LEN01370
C                                                                            LEN01380
C     OUTPUT OPTIONS:                                                        LEN01390
C     TO HAVE LENS SHAPE DATA PRINTED SET "SHAPE" TO 1. OTHERWISE            LEN01400
C     SET "SHAPE"=0                                                          LEN01410
C     TO HAVE SKEW RAY AND MIRROR IMAGE SKEW RAY DATA OUTPUT SET             LEN01420
C     "SCURAY" TO 1. ELSE SET "SCURAY" TO 0. (INTEGER)                       LEN01430
C     TO HAVE ELLIPSE SHAPE DATA PRINTED SET "ELLIPS" TO 1. OTHERWISE        LEN01440
```

```
C     SET "ELLIPS" = C                                                  LENC1450
      READ (5,*) SHAPE,SQURAY,ELLIPS                                    LENC1460
      RETURN                                                            LENC1470
      END                                                               LENC1480
                                                                        LENC1490
      SUBROUTINE SHAPE1                                                 LENC1500
      COMMON/D1/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            LENC1510
     1,ALFAP,GRID,ELLNUP,ENUM,ELLBF,PI,RAD,ICASE                        LENC1520
     2,SHAPE,SQURAY,ELLIPS,ICHECK                                       LENC1530
      COMMON/SHP/I1(1010),IIP(1010),I2(1010),I2P(1010)                  LENC1540
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LENC1550
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               LENC1560
      COMMON/SB/K,L,IZ,IZ1,M,N,NPL,FLAG(1000),IZA,RAYS,IZZ,DRAYS        LENC1570
     1,ALMOR,CCORD,NUMP,IANGLE,THICK,IZ4,IZ5,CCUNT,IZ6                  LENC1580
     2,CCCR(500),NUMPT,COORT,GAMMA,AB,CMP,STATMA                        LENC1590
     3,RAYY(1000),RAYZ(1000),CENI,TOPAI,ROTI,TOPI                       LENC1600
     4,RADIUS,CEN,TCP,PCT,TURN,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         LENC1610
     5,AP,NY,AZ,RX,RY,RZ,NXI,NYI,PHII,PHIIP,TIRA                        LENC1620
     6,API,NPZ,KPK,THETA,PHI,PHIP,AO,BO,CO,DO,EO,PAR1,PAR2             LENC1630
     7,PAR3,XC,YC,ZC,ALP,CMP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI   LENC1640
     8,NUM5,CKEP,CLPP,CMPP,D3,DPL(1000),DI,NUM6,NUM7,NTNCTY(1000)       LENC1650
     9,YIN(1000),ZIN(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO        LENC1660
      COMMON/SP/NUM8,THETAI,XD(APT(1000),YCIAPT(1000),SUM1              LENC1670
     1,SUM2,SUP2,SIGRAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           LENC1680
     2,RCC(300),SUM4(300),FPACTN(300),SDRAD(1000),YCENTR(20,500)        LENC1690
C                                                                       LENC1700
      INTEGER ELLNUP,ENUM,SHAPE,SQURAY,ELLIPS                           LENC1710
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,CCUNT,COOR,CCCRT              LENC1720
      REAL N1,N2,N3                                                     LENC1730
      REAL I1,IIP,I2,I2P                                                LENC1740
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LENC1750
      REAL NPI,KPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      LENC1760
     1,NINCTY                                                           LENC1770
C                                                                       LENC1780
      I1(J)=PI/2.-ALPHA-U                                               LENC1790
      IIP(J)=ARSIN(N1/N2*SIN(I1(J)))                                    LENC1810
      IF(J.EQ.1)CALL INIT                                               LENC1820
      CALL CALETA                                                       LENC1830
      I2(J)=I1(J)-IIP(J)-ETA(J)+U                                       LENC1840
      I2P(J)=ARSIN(N2/N3*SIN(I2(J)))                                    LENC1850
C     CALCULATION OF COORDINATES                                        LENC1860
      IF(J.GT.1)CALL POINTS                                             LENC1870
C     SLOPES OF NORMAL AND TANGENTIAL(SURFACE)                          LENC1880
   17 DYDXT(J)=COTAN(ETA(J))                                            LENC1890
      DYDXN(J)=-TAN(ETA(J))                                             LENC1900
      RETURN                                                            LENC1910
      END                                                               LENC1920
                                                                        LENC1930
      SUBROUTINE INIT                                                   LENC1940
      COMMON/D1/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            LENC1950
     1,ALFAP,GRID,ELLNUP,ENUM,ELLBF,PI,RAD,ICASE                        LENC1960
     2,SHAPE,SQURAY,ELLIPS,ICHECK                                       LENC1970
      COMMON/SHP/I1(1010),IIP(1010),I2(1010),I2P(1010)                  LENC1980
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LENC1990
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               LENC2000
C                                                                       LENC2010
      REAL N1,N2,N3                                                     LENC2020
      REAL I1,IIP,I2,I2P                                                LENC2030
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LENC2040
C                                                                       LENC2050
      Y1(1)=R                                                           LENC2060
      X1(1)=R/TAN(ALPHA)                                                LENC2070
      X2(1)=X1(1)+T(1)*COS(PI/2.0-ALPHA-IIP(1))                         LENC2080
      Y2(1)=Y1(1)-T(1)*SIN(PI/2.0-ALPHA-IIP(1))                         LENC2090
      BETA(1)=ATAN(Y2(1)/(BF-X2(1)))                                    LENC2100
      RETURN                                                            LENC2110
      END                                                               LENC2120
                                                                        LENC2130
      SUBROUTINE POINTS                                                 LENC2140
      COMMON/D1/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            LENC2150
     1,ALFAP,GRID,ELLNUP,ENUM,ELLBF,PI,RAD,ICASE                        LENC2160
     2,SHAPE,SQURAY,ELLIPS,ICHECK                                       LENC2170
```

```
      COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)                  LEN02170
     1,ETA(101C),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LEN02180
     2,J,UP(1C10),DYDXT(1010),DYDXN(1010)                               LEN02190
C                                                                       LEN02200
      REAL N1,N2,N3                                                     LEN02210
      REAL I1,I1P,I2,I2P                                                LEN02220
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN02230
C                                                                       LEN02240
      BPF=Y2(J-1)*(-DYDXN(J-1)+COTAN(BETA(J-1)))                        LEN02250
      X2(J)=BPF*(TAN(BETA(J))+DYDXT(J-1))-DYDXT(J-1)*BPF)               LEN02260
     1/(DYDXT(J-1)+TAN(BETA(J)))                                        LEN02270
      Y2(J)=TAN(BETA(J))*(-X2(J)+BPF)                                   LEN02280
      X1(J)=(Y2(J)+X2(J)*COTAN(ALPHA+I1P(J)))                           LEN02290
     1/(TAN(ALPHA)+COTAN(ALPHA+I1P(J)))                                 LEN02300
      Y1(J)=TAN(ALPHA)*X1(J)                                            LEN02310
      T(J)=SQRT((X2(J)-X1(J))**2+(Y1(J)-Y2(J))**2)                      LEN02320
      RETURN                                                            LEN02330
      END                                                               LEN02340
                                                                        LEN02350
      SUBROUTINE CALETA                                                 LEN02360
      COMMON/DT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            LEN02370
     1,ALFAP,GRID,ELLNUM,ENUM,ELLRF,PI,RAD,ICASE                        LEN02380
     2,SHAPE,SCURAY,ELLIPS,ICHECK                                       LEN02390
      COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)                  LEN02400
     1,ETA(101C),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LEN02410
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               LEN02420
      COMMON/SP/K,L,IZ,IZ1,M,N,NP1,FLAG(1000),IZ3,RAYS,IZ2,DRAYS        LEN02430
     1,NUMBR,CCORD,NUMB,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                  LEN02440
     2,CCOR(5CC),NUMBT,COORT,GAMMA,AB,DNP,STATNA                        LEN02450
     3,RAYY(1CC0),RAYZ(1000),CEN1,TORBI,BOTI,TOPI                       LEN02460
     4,RADIUS,CEN,TCP,BCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         LEN02470
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN02480
     6,AFI,NPJ,NPK,THETA,PHI,PHIP,AU,BO,CO,DC,EC,PAR1,PAR2              LEN02490
     7,PAR3,XC,YC,ZC,NUP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI    LEN02500
     8,NUM5,CKPP,CLPP,CMPP,D3,OPL(1000),DI,NUM6,NUM7,NTNCTY(1000)       LEN02510
     9,YIM(1CC),ZIM(1CC),ELL,ELY(7,1010),ELZ(7,1000),ELZZ,ZOYO          LEN02520
      COMMON/SP/NUMB,THETA1,XDIAPT(1000),YDIAPT(1000),SUM1              LEN02530
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           LEN02540
     2,RCC(3CC),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)        LEN02550
C                                                                       LEN02560
      INTEGER ELLNUM,ENUM,SHAPE,SCURAY,ELLIPS                           LEN02570
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,CCOR,COORT              LEN02580
      REAL N1,N2,N3                                                     LEN02590
      REAL I1,I1P,I2,I2P                                                LEN02600
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN02610
      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      LEN02620
     1,NTNCTY                                                           LEN02630
C                                                                       LEN02640
      AUP=N2/N3*COS(I1(J)-I1P(J)+U)-COS(BETA(J))                        LEN02650
      ADCWN=N2/N3*SIN(I1(J)-I1P(J)+U)-SIN(BETA(J))                      LEN02660
      A=ALP/ADCWN                                                       LEN02670
      X=SQRT(1.0/(1.0+A**2))                                            LEN02680
      ETA(J)=ARSIN(X)                                                   LEN02690
      RETURN                                                            LEN02700
      END                                                               LEN02710
                                                                        LEN02720
      SUBROUTINE SHAPEC                                                 LEN02730
      COMMON/DT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            LEN02740
     1,ALFAP,GRID,ELLNUM,ENUM,ELLRF,PI,RAD,ICASE                        LEN02750
     2,SHAPE,SCURAY,ELLIPS,ICHECK                                       LEN02760
      COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)                  LEN02770
     1,ETA(101C),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LEN02780
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               LEN02790
      COMMON/SP/K,L,IZ,IZ1,M,N,NP1,FLAG(1000),IZ3,RAYS,IZ2,DRAYS        LEN02800
     1,NUMBR,CCORD,NUMB,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                  LEN02810
     2,CCOR(5CC),NUMBT,COORT,GAMMA,AB,DNP,STATNA                        LEN02820
     3,RAYY(1CC0),RAYZ(1000),CEN1,TORBI,BOTI,TOPI                       LEN02830
     4,RADIUS,CEN,TCP,BCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         LEN02840
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN02850
     6,AFI,NPJ,NPK,THETA,PHI,PHIP,AU,BO,CO,DC,EC,PAR1,PAR2              LEN02860
     7,PAR3,XC,YC,ZC,NUP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI    LEN02870
     8,NUM5,CKPP,CLPP,CMPP,D3,OPL(1000),DI,NUM7,NUM8,NTNCTY(1000)       LEN02880
```

```
     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO
      COMMON/SP/NUMP,THETAI,XD(APT(1000),YC(APT(1000),SUM1
     1,SUM2,SUM3,SIGMAZ(10),500),SIGMAY(10,500),RMSRAD(10,500)
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)
C
      INTEGER ELLNUM,EAUM,SHAPE,SQURAY,ELLIPS
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,CUOR,COORT
      REAL N1,N2,N3
      REAL II,IIP,I2,I2P
     1,AD,NY,NZ,RX,RY,RZ,AXI,NYI,NZI,PHII,PHIIP,TIRA
      REAL NPI,NPJ,NPK,NUP,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8
     1,NTNCTY
C
      BETA(I)=ATAN(R/(EF-R*COTAN(ALPHA)))
      X2(J)=((SIN(BETA(J)))/(SIN(THETA(J))+(TAN(ALPHA))*COS(BETA(J))))
      Y2(J)=(X2(J))*TAN(ALPHA)
      I2F(J)=-ALPHA+ATAN((EF-X2(J))/Y2(J))
      I2(J)=ARSIN((R/N2)*SIN(I2P(J)))
      UP(J)=PI/2.0-ALPHA-I2(J)
      ETA(J)=UP(J)+I2(J)
      IF(J.GT.1)CALL CALIC
      X1(J)=X2(J)-T(J)*COS(UP(J))
      Y1(J)=Y2(J)+T(J)*SIN(UP(J))
      II(J)=ARSIN(SQRT(((SIN(UP(J)-U))**2)/((COS(UP(J)-U)-(N1/N2))**2+
     1(SIN(UP(J)-U))**2)))
      IIP(J)=ARSIN((AL/A2)*SIN(II(J)))
      DYDXN(J)=-TAN(II(J)+U)
      DYDXT(J)=COTAN(II(J)+U)
      RETURN
      END

      SUBROUTINE CALIC
      COMMON/D1/E,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),EF
     1,ALFAP,GFID,ELLNUP,EAUM,ELLBF,PI,RAD,ICASE
     2,SHAPE,SQURAY,ELLIPS,ICHECK
      COMMON/SP/II(1010),IIP(1010),I2(1010),I2P(1010)
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)
      COMMON/SP/K,L,IZ,IZI,M,N,NPL,FLAG(1000),IZO,RAYS,IZZ,DRAYS
     1,NUMPR,CCOPO,NLMP,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6
     2,CCCP(500),NUMPT,COORT,GAMMA,AM,OMP,STATNA
     3,RAYY(1000),RAYZ(1000),CENI,IOPBI,ROTI,TOPI
     4,RADIUS,CEN,TCP,RCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP
     5,AX,NY,NZ,RX,RY,RZ,AXI,NYI,NZI,PHII,PHIIP,TIRA
     6,API,NPJ,APK,THETA,PHI,PHIP,AU,HO,CO,DO,EO,PAR1,PAR2
     7,PAR3,XC,YC,ZO,ALP,CKP,CLP,CMP,NUML,NUM2,NUM3,NUM4,C2,XI,YI,ZI
     8,NUMS,CKPP,CLPP,CMPP,U3,OPL(1000),DI,NUM6,NUM7,NTNCTY(1000)
     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO
      COMMON/SP/NUMP,THETAI,XD(APT(1000),YC(APT(1000),SUM1
     1,SUM2,SLP3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)
C
      INTEGER ELLNUP,EAUM,SHAPE,SQURAY,ELLIPS
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT
      REAL N1,N2,N3
      REAL II,IIP,I2,I2P
     1,AX,NY,NZ,RX,RY,RZ,AXI,NYI,NZI,PHII,PHIIP,TIRA
      REAL NPI,APJ,APK,AUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8
     1,NTNCTY
C
      YI(J)=((COTAN(II(J-1)+U))*(COTAN(UP(J))))*(Y2(J)+
     1  X2(J)*TAN(UP(J)))+Y1(J-1)-X1(J-1)*COTAN(II(J-1)+U))/(1.0+
     1  (COTAN(II(J-1)+U)*COTAN(UP(J))))
      XI(J)=(COTAN(UP(J)))*(-Y1(J)+Y2(J)+X2(J)*TAN(UP(J)))
      T(J)=SQRT((X2(J)-X1(J))**2+(Y1(J)-Y2(J))**2)
      RETURN
      END

      SUBROUTINE NOSE
      COMMON/D1/E,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),EF
     1,ALFAP,GFID,ELLNUP,EAUM,ELLBF,PI,RAD,ICASE
     2,SHAPE,SQURAY,ELLIPS,ICHECK
```

LEN02800
LEN02900
LEN02910
LEN02920
LEN02930
LEN02940
LEN02950
LEN02960
LEN02970
LEN02980
LEN02990
LEN03000
LEN03010
LEN03020
LEN03030
LEN03040
LEN03050
LEN03060
LEN03070
LEN03080
LEN03090
LEN03100
LEN03110
LEN03120
LEN03130
LEN03140
LEN03150
LEN03160
LEN03170
LEN03180
LEN03190
LEN03200
LEN03210
LEN03220
LEN03230
LEN03240
LEN03250
LEN03260
LEN03270
LEN03280
LEN03290
LEN03300
LEN03310
LEN03320
LEN03330
LEN03340
LEN03350
LEN03360
LEN03370
LEN03380
LEN03390
LEN03400
LEN03410
LEN03420
LEN03430
LEN03440
LEN03450
LEN03460
LEN03470
LEN03480
LEN03490
LEN03500
LEN03510
LEN03520
LEN03530
LEN03540
LEN03550
LEN03560
LEN03570
LEN03580
LEN03590
LEN03600

```
      COMMON/SHP/X1(1010),X1P(1010),X2(1010),X2P(1010)                  LEN03610
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LEN03620
     2,J,UP(1010),DYDX1(1010),DYDXN(1010)                               LEN03630
      COMMON/SP/K,L,IZ,IZ1,M,N,NPI,FLAG(1000),IZO,RAYS,IZ2,DRAYS        LEN03640
     1,NUMBR,CCORD,NUMB,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                  LEN03650
     2,CCOR(500),NUMET,COORT,GAMMA,AB,ONP,STATNA                        LEN03660
     3,RAYY(1000),RAYZ(1000),CENI,TORBI,BOTI,TOPI                       LEN03670
     4,RADIUS,CEN,TCP,RCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         LEN03680
     5,AX,NY,AZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN03690
     6,NPI,NPJ,NPK,THETA,PHI,PHIP,AU,BO,CO,DC,EC,PAR1,PAR2              LEN03700
     7,PAR3,XC,YO,ZO,NUP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI    LEN03710
     8,NUM5,CREF,CLPF,CPPP,D3,OPL(1000),DI,NUM6,NUM7,NTNCTY(1000)       LEN03720
     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO        LEN03730
      COMMON/SP/NUM8,THETAI,XDIAPT(1000),YDIAPT(1000),SUM1              LEN03740
     1,SLN2,SUP3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           LEN03750
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)        LEN03760
C                                                                       LEN03770
      INTEGER ELLNUM,EALM,SHAPE,SQURAY,ELLIPS                           LEN03780
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT              LEN03790
      REAL N1,N2,N3                                                     LEN03800
      REAL I1,IIP,I2,I2P                                                LEN03810
     1,AX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN03820
      REAL NPI,NPJ,NPK,NUP,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      LEN03830
     1,NTNCTY                                                           LEN03840
C                                                                       LEN03850
C   OPAQUE NOSE SECTION FOLLOWS                                         LEN03860
C                                                                       LEN03870
      GO TO (1,2),ICASE                                                 LEN03880
    1 AB=(-)(J-1)+(Y1(J-1))/DYDX1(J-1)                                  LEN03890
      STATNA=-AB                                                        LEN03900
      GAMMA=ATAN(DYDX1(J-1))                                            LEN03910
      ONP=(Y1(J-1))/SIN(GAMMA)                                          LEN03920
      IF(SHAPE.EQ.1)WRITE(6,300)GAMMA,STATNA,ONP                        LEN03930
      GO TO 90                                                          LEN03940
    2 AB=+X2(K)                                                         LEN03950
      BF=BF-AB                                                          LEN03960
      DO 10 J=1,K                                                       LEN03970
      X1(J)=X1(J)-AB                                                    LEN03980
   10 X2(J)=X2(J)-AB                                                    LEN03990
      GO TO 90                                                          LEN04000
  300 FORMAT('C',1X,'OPAQUE NOSE SECTION:'//1X,'NOSE HALF ANGLE = ',    LEN04010
     1F7.5,2X,'STATION A = ',F9.5,2X,'SURFACE LENGTH = ',F7.5////)      LEN04020
   90 RETURN                                                            LEN04030
      END                                                               LEN04040
                                                                        LEN04050
      SUBROUTINE ZOYC                                                   LEN04060
      COMMON/D1/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            LEN04070
     1,ALFAP,GFID,ELLNUP,ENUP,ELLBF,PI,RAD,ICASE                        LEN04080
     2,SHAPE,SQURAY,ELLIPS,ICHECK                                       LEN04090
      COMMON/SHP/X1(1010),X1P(1010),X2(1010),X2P(1010)                  LEN04100
      COMMON/SHP/I1(1010),IIP(1010),I2(1010),I2P(1010)                  LEN04110
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LEN04120
     2,J,UP(1010),DYDX1(1010),DYDXN(1010)                               LEN04130
      COMMON/SP/K,L,IZ,IZ1,M,N,NPI,FLAG(1000),IZO,RAYS,IZ2,DRAYS        LEN04140
     1,NUMBR,CCORD,NUMB,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                  LEN04150
     2,CCOR(500),NUMET,COORT,GAMMA,AB,ONP,STATNA                        LEN04160
     3,RAYY(1000),RAYZ(1000),CENI,TORBI,BOTI,TOPI                       LEN04170
     4,RADIUS,CEN,TCP,RCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         LEN04180
     5,AX,NY,AZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN04190
     6,NPI,NPJ,NPK,THETA,PHI,PHIP,AU,BO,CO,DC,EC,PAR1,PAR2              LEN04200
     7,PAR3,XC,YO,ZO,NUP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI    LEN04210
     8,NUM5,CREF,CLPF,CPPP,D3,OPL(1000),DI,NUM6,NUM7,NTNCTY(1000)       LEN04220
     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO        LEN04230
      COMMON/SP/NUM8,THETAI,XDIAPT(1000),YDIAPT(1000),SUM1              LEN04240
     1,SLN2,SUP3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           LEN04250
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)        LEN04260
C                                                                       LEN04270
      INTEGER ELLNUM,EALM,SHAPE,SQURAY,ELLIPS                           LEN04280
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT              LEN04290
      REAL N1,N2,N3                                                     LEN04300
      REAL I1,IIP,I2,I2P                                                LEN04310
     1,AX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN04320
      REAL NPI,NPJ,NPK,NUP,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      LEN04330
```

```
     1,NTNCTY                                                          LEN04330
                                                                       LEN04340
C    ALGORITHM TRACE RAY (SEE INPUTS;X1(J),Y1(J),DYDXN(J),X2(J))      LEN04350
       IF(ICHECK.EQ.2)GO TO 21                                         LEN04360
       IF(ICHECK.EQ.3)GO TO 30                                         LEN04370
       IZ=1                                                            LEN04380
       CCUNT=1                                                         LEN04390
       RAYY(IZ)=1.0                                                    LEN04400
       RAYZ(IZ)=0.0                                                    LEN04410
       NTNCTY(IZ)=1.0                                                  LEN04420
       IF(SCURAY .EQ. 1) WRITE(6,400) ALEAP,GRID                       LEN04430
   20  ICHECK=0                                                        LEN04440
       IF(RAYZ(IZ) .GE. Y1(K)) GO TO 30                                LEN04450
         CENI=(ER+X1(K))*SIN(ALEAP)                                    LEN04460
         TCRRI=SQRT(Y1(K)**2-RAYZ(IZ)**2)                              LEN04470
         BCTI=(CENI-TCRRI)                                             LEN04480
         IF(RAYY(IZ) .LE. BCTI) GO TO 30                               LEN04490
           TOPI=CENI+TCRRI                                             LEN04500
           IF(RAYY(IZ) .GE. TOPI) GO TO 30                             LEN04510
             RAYZ(IZ)=RAYZ(IZ)+GRID                                    LEN04520
             GO TO 20                                                  LEN04530
   30 ICHECK=0                                                         LEN04540
C  SEARCH FOR Y1(J) JUST GT RAYZ(IZ); RETRIEVE X1(J)                   LEN04550
       M=N/2                                                           LEN04560
       IF(Y1(M) .LT. RAYZ(IZ)) GO TO 32                                LEN04570
         IF(RAYY(IZ) .GT. 1.15) GO TO 32                               LEN04580
           M=K-1                                                       LEN04590
   31 CONTINUE                                                         LEN04600
       IF(Y1(M) .GT. RAYZ(IZ)) GO TO 36                                LEN04610
         K=N-1                                                         LEN04620
         IF(N .EQ. 0) GO TO 34                                         LEN04630
         GO TO 31                                                      LEN04640
   32 CONTINUE                                                         LEN04650
       K=M                                                             LEN04660
   33 CONTINUE                                                         LEN04670
       IF(Y1(M) .GT. RAYZ(IZ)) GO TO 36                                LEN04680
         K=N-1                                                         LEN04690
         IF(N .EQ. 0) GO TO 34                                         LEN04700
           GO TO 33                                                    LEN04710
   34 CONTINUE                                                         LEN04720
       RAYZ(IZ)=0.0                                                    LEN04730
       IF(RAYY(IZ) .LT. 0.0) GO TO 35                                  LEN04740
         RAYZ(IZ)=RAYY(IZ)+GRID                                        LEN04750
         GO TO 20                                                      LEN04760
   35 CONTINUE                                                         LEN04770
       RAYY(IZ)=RAYY(IZ)-GRID                                          LEN04780
       GO TO 20                                                        LEN04790
  400 FORMAT('1','SKEW RAY TRACE PARAMETERS:'///5X,'ALEAP= ',F9.7,2X,  LEN04800
     1'GRID= ',F9.7,2X,'SEE LENS PARAMETERS ABOVE.'///2X,'RAY',2X,     LEN04810
     2'RAYY',4X,'RAYZ',4X,'XC',6X,'YC',6X,'XI',6X,'YI',6X,'ZI',6X,     LEN04820
     3'OPL',5X,'YIP',5X,'ZIP',5X,'NTNCTY',2X,'XDIAPT',4X,'YDIAPT'      LEN04830
     4/7X,'PHII',6X,'PHIP',3X,'CKPP',4X,'CLPP',4X,'CMPP',4X,           LEN04840
     5'D2',6X,'D1',6X,'NUM5',4X,'NUM7',4X,'NUM8'//)                    LEN04850
   36 RETURN                                                           LEN04860
       END                                                             LEN04870
                                                                       LEN04880
       SUBROUTINE RAD1                                                 LEN04890
       COMMON/DATA/ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),RF          LEN04900
      1,ALEAP,GRID,ELNUM,ENDY,ELLAF,PI,PAD,ICASE                       LEN04910
      2,SCARF,SCURAY,ELLIPS,ICHECK                                     LEN04920
       COMMON/SEP/X1(1010),Y1(1010),X2(1010),Y2(1010)                  LEN04930
      1,ETA(1010),X(1010),Y(1010),X2(1010),Y2(1010)                    LEN04940
      2,J,OPL(1010),DYDXT(1010),DYDXN(1010)                            LEN04950
       COMMON/SK/K,L,IZ,IZ1,A,N,NPI,FLAG(1000),IZO,RAYS,IZZ,CRAYS      LEN04960
      1,NUMER,CCEND,NUMP,ANGLE,THICK,IZ4,IZ5,COUNT,IZ6                 LEN04970
      2,CCOP(5CC),NUMBT,CUCRT,GAMMA,AE,UNP,STATNA                      LEN04980
      3,RAYY(1CC0),RAYZ(1000),CENI,TCRBI,BOTI,TOPI                     LEN04990
      4,RADIUS,CEN,TCP,RCT,TORD,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP       LEN05000
      5,AX,AY,AZ,BX,BY,BZ,NXI,NYI,NZI,PHII,PHIP,TIPA                   LEN05010
      6,API,NPJ,APK,THETA,PHI,PHIP,AO,BO,CO,DC,EO,PAR1,PAR2            LEN05020
      7,PAR3,XC,YO,ZC,NLP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI  LEN05030
      8,NUM5,CKPP,CLPP,CMPP,D3,OPL(1000),DI,NUM6,NUM7,NTNCTY(1000)     LEN05040
```

```
     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO          LEN05050
      COMMON/SP/NUMB,THETA1,XDIAPT(1000),YDIAPT(1000),SUM1                LEN05060
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)             LEN05070
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)          LEN05080
C                                                                         LEN05090
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                             LEN05100
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT                LEN05110
      REAL N1,N2,N3                                                       LEN05120
      REAL I1,I1P,I2,I2P                                                  LEN05130
     1,AX,AY,AZ,RX,RY,RZ,NX1,NY1,NZ1,PHI1,PHI1P,TIRA                      LEN05140
      REAL NP1,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8        LEN05150
     1,ANGCTY                                                             LEN05160
C                                                                         LEN05170
   36    GO TO (361,362),ICASE                                           LEN05180
  361    YRN=Y1(N)                                                       LEN05190
         YR1=Y1(1)                                                       LEN05200
      RADIUS=SQRT(RAYZ(IZ)**2+((RAYY(IZ)/COS(ALFAP))-(X1(N)+AB)*         LEN05210
     1TAN(ALFAP))**2)                                                     LEN05220
         GO TO 363                                                       LEN05230
  362    YRN=Y2(N)                                                       LEN05240
         YR1=Y2(1)                                                       LEN05250
         Y1=YC+(CLP/CKP*(X2(N)-XO))                                      LEN05260
         Z1=ZC+(CMP/CKP*(X2(N)-XO))                                      LEN05270
      RADIUS=SQRT(Y1**2+Z1**2)                                           LEN05280
  363 IF(YRN .GT. RADIUS) GO TO 40                                       LEN05290
         IF(RADIUS .GT.YR1) GO TO 37                                     LEN05300
         N=N-1                                                           LEN05310
         GO TO 36                                                        LEN05320
   37 CONTINUE                                                           LEN05330
      N=N-1                                                              LEN05340
      IF(N .GT. 0) GO TO 36                                              LEN05350
      CEN=(X1(1)+AB)*SIN(ALFAP)                                          LEN05360
      TORB=Y1(1)*COS(ALFAP)                                              LEN05370
      RAYZ(IZ)=0.0                                                       LEN05380
      IF(RAYY(IZ) .GE. 0.0) GO TO 38                                     LEN05390
         RAYY(IZ)=RAYY(IZ)-GRID                                          LEN05400
         BOT=CEN-TORB                                                    LEN05410
C        CHECK FOR BOTTOM EDGE OF LENS, GO TO MIRROR IMAGE RAYS          LEN05420
         IF(RAYY(IZ) .LT. BOT) ICHECK=60                                 LEN05430
         IF(RAYY(IZ) .GE. BOT) ICHECK=20                                 LEN05440
         RETURN                                                          LEN05450
   38 CONTINUE                                                           LEN05460
      RAYY(IZ)=RAYY(IZ)+GRID                                             LEN05470
      TOP=CEN+TORB                                                       LEN05480
      IF(RAYY(IZ) .GT. TOP) GO TO 39                                     LEN05490
         ICHECK=20                                                       LEN05500
         RETURN                                                          LEN05510
   39 CONTINUE                                                           LEN05520
      RAYY(IZ)=-GRID                                                     LEN05530
      ICHECK=20                                                          LEN05540
      RETURN                                                             LEN05550
   40 ICHECK=40                                                          LEN05560
      RETURN                                                             LEN05570
      END                                                                LEN05580
                                                                         LEN05590
      SUBROUTINE SKEWC                                                   LEN05600
      COMMON/DIF/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            LEN05610
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                         LEN05620
     2,SHAPE,SQURAY,ELLIPS,ICHECK                                        LEN05630
      COMMON/SEP/I1(1010),I1P(1010),I2(1010),I2P(1010)                   LEN05640
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                     LEN05650
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                                LEN05660
      COMMON/SK/K,L,IZ,IZ1,4,N,NP1,FLAG(1000),IZO,RAYS,IZ2,DRAYS         LEN05670
     1,ALMBR,COORD,NUMP,ANGLE,THICK,IZ4,IZ5,COUNT,IZ6                    LEN05680
     2,COOR(500),NUMPT,COORT,GAMMA,AB,OMP,STATNA                         LEN05690
     3,RAYY(1000),RAYZ(1000),CEN1,TORB1,POTI,TOPI                        LEN05700
     4,RADIUS,CEN,TOP,BOT,TORB,DELTAX,DELTAY,SP,SI,RATIO,DYDXNP          LEN05710
     5,AX,AY,AZ,RX,RY,RZ,NX1,NY1,NZ1,PHI1,PHI1P,TIRA                     LEN05720
     6,NP1,NPJ,NPK,THETA,PHI,PHIP,A0,B0,C0,CC,EC,PAR1,PAR2               LEN05730
     7,PAR3,XO,YO,ZC,NUM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI     LEN05740
     8,NUM5,CREF,CLPF,CNPP,D3,OPL(1000),D1,NUM6,NUM7,ANGCTY(1000)        LEN05750
     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO         LEN05760
```

```
      COMMON/SP/NUMB,THETAI,XDIAPT(1000),YDIAPT(1000),SUM1          LEN05770
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)       LEN05780
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)    LEN05790
C                                                                   LEN05800
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                       LEN05810
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT          LEN05820
      REAL N1,N2,N3                                                 LEN05830
      REAL I1,I1P,I2,I2P                                            LEN05840
     1,AX,AY,AZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA               LEN05850
      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8  LEN05860
     1,ANCTY                                                        LEN05870
C                                                                   LEN05880
   40 NPI=N+1                                                       LEN05890
C     CALCULATE INTERCEPT POINT ON OUTER SURFACE                    LEN05900
      AD=RAYY(IZ)/COS(ALFAP)                                        LEN05910
      BC=TAN(ALFAP)                                                 LEN05920
      CD=(Y1(N)-Y1(NPI))/(X1(N)-X1(NPI))                            LEN05930
      CC=X1(NPI)                                                    LEN05940
      EC=Y1(NPI)                                                    LEN05950
      PAR1=(AC*BC+CD*EC-(CC**2)*DD-AB*(BD**2))                      LEN05960
      PAR2=(EC**2-CC**2)                                            LEN05970
      PAR3=(AC**2+AB*(BC**2)*AB-2.0*AD*BD*AB+                       LEN05980
     1RAYZ(IZ)**2-(EC-CC*DD)**2)                                    LEN05990
      XC=(PAR1/PAR2)+SQRT((PAR1/PAR2)**2-PAR3/PAR2)                 LEN06000
      YC=(RAYY(IZ)/COS(ALFAP))-(XD+AB)*TAN(ALFAP)                   LEN06010
      ZC=RAYZ(IZ)                                                   LEN06020
C     CALCULATE THE DIRECTION COSINES OF OUTSIDE SURFACE NORMAL     LEN06030
      DELTAX=X1(N)-X1(NPI)                                          LEN06040
      DELTAY=Y1(N)-Y1(NPI)                                          LEN06050
      SP=SQRT((RADIUS-Y1(NPI))**2+(XC-X1(NPI))**2)                  LEN06060
      ST=SQRT(DELTAX**2+DELTAY**2)                                  LEN06070
      RATIO=SP/ST                                                   LEN06080
      DYDXNP=RATIO*(DYDXN(N)-DYDXN(NPI))+DYDXN(NPI)                 LEN06090
      NPI=1.0/DYDXNP                                                LEN06100
      IF(YD .EQ. 0.0) GO TO 41                                      LEN06110
        ZOYD=(ZC/YC)                                                LEN06120
        IF(ZOYC .GE. 8235000) GO TO 41                              LEN06130
        IF(ZOYC .LE. -8235000) GO TO 42                             LEN06140
          NPJ=COS(ATAN(ZO/YO))                                      LEN06150
          NPK=SIN(ATAN(ZO/YO))                                      LEN06160
          GO TO 43                                                  LEN06170
   41 CONTINUE                                                      LEN06180
      NPJ=0.0                                                       LEN06190
      NPK=1.0                                                       LEN06200
      GO TO 43                                                      LEN06210
   42 CONTINUE                                                      LEN06220
      NPJ=0.0                                                       LEN06230
      NPK=-1.0                                                      LEN06240
   43 CONTINUE                                                      LEN06250
C     DIRECTION COSINES OF OUTSIDE SURFACE NORMAL                   LEN06260
      NX=NPI/(SQRT(NPI**2+NPJ**2+NPK**2))                           LEN06270
      NY=(NPJ*NX)/NPI                                               LEN06280
      NZ=(NPK*NX)/NPI                                               LEN06290
      IF(RAYY(IZ) .LT. 0.0) GO TO 44                                LEN06300
        GO TO 45                                                    LEN06310
   44 CONTINUE                                                      LEN06320
      NY=-NY                                                        LEN06330
      NZ=-NZ                                                        LEN06340
   45 CONTINUE                                                      LEN06350
C     DIRECTION COSINES OF EXTERNAL RAY                             LEN06360
      RX=COS(ALFAP)                                                 LEN06370
      RY=-SIN(ALFAP)                                                LEN06380
      THETA=ARCOS(RX*NX+RY*NY)                                      LEN06390
C     ANGLES OF INCIDENCE AND REFRACTION OUTSIDE SURFACE            LEN06400
      PHI=PI-THETA                                                  LEN06410
      PHIP=ARSIN((N1/N2)*SIN(PHI))                                  LEN06420
C                                                                   LEN06430
C    INSERT CALCULATION OF TRANSMITED INTENSITY/POLARIZATION        LEN06440
C                                                                   LEN06450
      NUM=COS(PHIP)-(N1/N2)*COS(PHI)                                LEN06460
C     DIRECTION COSINES OF INTERNAL REFRACTED RAY                   LEN06470
      CKP=(N1/N2)*RX-NUM*NX                                         LEN06480
```

```
      CLP=(N1/N2)*RY-NUM*NY                                              LEN06490
      CMP=-NUM*NZ                                                        LEN06500
C     INTERNAL RAY LENGTH AND INSIDE SURFACE INTERCEPT                   LEN06510
      NUM1=(CLP*YO+CMP*ZO-CKP*XO*(TAN(ALPHA)**2))                        LEN06520
      NUM2=(CLP**2+CMP**2-(CKP**2)*(TAN(ALPHA)**2))                      LEN06530
      NUM3=(YO**2+ZO**2-(XO**2)*(TAN(ALPHA)**2))                         LEN06540
      NUM4=NUM1**2-NUM2*NUM3                                             LEN06550
C     CHECK FOR INTERCEPT WITH INSIDE SURFACE                            LEN06560
      IF(NUM4 .LT. 0.0) GO TO 50                                         LEN06570
        D2=-NUM1/NUM2-SQRT(NUM4)/NUM2                                    LEN06580
        XI=D2*CKP+XO                                                     LEN06590
        IF(SQUARY.NE.2)GO TO 99                                          LEN06600
        WRITE(6,97)XI,D2,NUM1,NUM2,NUM3,NUM4,RX,RY,NX,NY,NZ              LEN06610
     1   ,CKP,CLP,CMP,PHI,PHIP,RAYY(IZ),RAYZ(IZ)                        LEN06620
   99   CONTINUE                                                         LEN06630
        IF(XI .LT. 0.0 .OR. XI .GT. X2(I)) GO TO 51                      LEN06640
          YI=D2*CLP+YO                                                   LEN06650
          ZI=D2*CMP+ZO                                                   LEN06660
          NUM5=SQRT((XI**2)*(TAN(ALPHA)**4)+YI**2+ZI**2)                 LEN06670
C         DIRECTION COSINES OF INSIDE NORMAL                             LEN06680
          NXI=-XI*(TAN(ALPHA)**2)/NUM5                                   LEN06690
          NYI=YI/NUM5                                                    LEN06700
          NZI=ZI/NUM5                                                    LEN06710
          THETAI=ARCOS((CKP*NXI)+(CLP*NYI)+(CMP*NZI))                    LEN06720
C         ANGLES OF INCIDENCE AND TOTAL INTERNAL REFLECTION              LEN06730
C         AT THE INSIDE SURFACE:                                         LEN06740
          PHII=PI-THETAI                                                 LEN06750
          TIRA=ARSIN(N3/N2)                                              LEN06760
C         CHECK FOR TOTAL INTERNAL REFLECTION:                           LEN06770
          IF(PHII .GE. TIRA) GO TO 52                                    LEN06780
            PHIIP=ARSIN((N2/N3)*SIN(PHII))                               LEN06790
        RETURN                                                           LEN06800
   50     ICHECK=50                                                      LEN06810
          RETURN                                                         LEN06820
   51     ICHECK=51                                                      LEN06830
          RETURN                                                         LEN06840
   52     ICHECK=52                                                      LEN06850
   97     FORMAT(3X,11E8.3/3X,7E8.3)                                     LEN06860
          RETURN                                                         LEN06870
        END                                                              LEN06880
                                                                         LEN06890
      SUBROUTINE SKENT                                                   LEN06900
      COMMON/D1/E,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),PE             LEN06910
     1,ALEAP,GRID,ELLNUM,ENUM,ELLRF,PI,RAD,ICASE                         LEN06920
     2,SHAPE,SQUARY,ELLIPS,ICHECK                                        LEN06930
      COMMON/SEP/I1(1010),I1P(1010),I2(1010),I2P(1010)                   LEN06940
     1,ETA(101C),X1(101C),Y1(1010),X2(1010),Y2(1010)                     LEN06950
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                                LEN06960
      COMMON/SK/K,L,IZ,IZ1,M,N,NP1,FLAG(1000),IZ1,RAYS,IZ2,DRAYS         LEN06970
     1,NUMBR,COORD,NUMP,ANGLE,THICK,IZ4,IZ5,COUNT,IZ6                    LEN06980
     2,COOR(5CC),NUMBT,COORT,GAMMA,AB,ONP,STATNA                         LEN06990
     3,RAYY(1000),RAYZ(1000),CENT,TORB1,BOTT,TOPT                        LEN07000
     4,RADIUS,CEN,TCE,PCT,TURB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP          LEN07010
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                     LEN07020
     6,NPI,NPJ,NPK,THETA,PHI,PHIP,AU,BU,CU,DC,EU,PAR1,PAR2               LEN07030
     7,PAR3,XO,YO,ZO,NUM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,C2,XI,YI,ZI     LEN07040
     8,NUM5,CKEP,CLPE,CMPP,D3,OPLE(1000),D1,NUM6,NUM7,NINCTY(100))       LEN07050
     9,YIM(100C),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO         LEN07060
      COMMON/SP/NUMB,THETAI,XDIAPT(1000),YDIAPT(1000),SUM1               LEN07070
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),PMSRAD(10,500)            LEN07080
     2,RCC(300),SUM4(300),FRACTN(2?1),SUMAD(1000),YCENTR(20,500)         LEN07090
C                                                                        LEN07100
      INTEGER ELLNUM,ENUM,SHAPE,SQUARY,ELLIPS                            LEN07110
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT               LEN07120
      REAL N1,N2,N3                                                      LEN07130
      REAL I1,I1P,I2,I2P                                                 LEN07140
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                     LEN07150
      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUMB       LEN07160
     1,NINCTY                                                            LEN07170
C                                                                        LEN07180
        AS=TAN(ALPHA)                                                    LEN07190
        CS=RAYY(IZ)/COS(ALEAP)                                           LEN07200
```

```
      DS=TAN(ALFAP)                                                     LEN07210
      A2D2=CS**2-DS**2                                                  LEN07220
      CDS=CS*DS*(AB)*A2D2                                               LEN07230
      C7D=CS**2*RAYZ(IZ)**2-((AB)**2)*A2D2-2.0*CS*DS*(AB)               LEN07240
    XC=1.0/A2D2*(-CDS*SQRT(CDS**2+A2D2*(CZD)))                          LEN07250
    YC=CS-(XC+AB)*DS                                                    LEN07260
    ZC=RAYZ(IZ)                                                         LEN07270
      NX=-SIN(ALFAP)                                                    LEN07280
      IF(YC .EQ. 0.0) GO TO 41                                          LEN07290
      ZOYC=(ZC/YC)                                                      LEN07300
      IF(ZOYC .GE. .8235123) GO TO 41                                   LEN07310
      IF(ZOYC .LE. -.8235123) GO TO 42                                  LEN07320
      SIG=ATAN(ZOYO)                                                    LEN07330
C     DIRECTION COSINES OF OUTSIDE SURFACE NORMAL                       LEN07340
      NY=COS(SIG)*COS(ALPHA)                                            LEN07350
      NZ=SIN(SIG)*COS(ALPHA)                                            LEN07360
      GO TO 43                                                          LEN07370
   41   NY=0.0                                                          LEN07380
        NZ=1.0*COS(ALPHA)                                               LEN07390
        GO TO 43                                                        LEN07400
   42   NY=0.0                                                          LEN07410
        NZ=-1.0*COS(ALPHA)                                              LEN07420
   43   CONTINUE                                                        LEN07430
        IF(RAYY(IZ).GE.0.0)GO TO 45                                     LEN07440
        NY=-NY                                                          LEN07450
        NZ=-NZ                                                          LEN07460
   45 CONTINUE                                                          LEN07470
C     DIRECTION COSINES OF RAY                                          LEN07480
      RX=COS(ALFAP)                                                     LEN07490
      RY=-SIN(ALFAP)                                                    LEN07500
      RZ=0.0                                                            LEN07510
C     ANGLES OF INCIDENCE AND REFRACTION OUTSIDE SURFACE                LEN07520
      THETA=ARCOS(NX*RX+NY*RY)                                          LEN07530
      PHI=PI-THETA                                                      LEN07540
      PHIP=ARSIN((N1/N2)*SIN(PHI))                                      LEN07550
C                                                                       LEN07560
C      DIRECTION COSINES OF INTERNAL REFRACTED RAY                      LEN07570
      NUM=COS(PHIP)-N1/N2*COS(PHI)                                      LEN07580
      CMP=N1/N2*RX-NUM*NX                                               LEN07590
      CLP=N1/N2*RY-NUM*NY                                               LEN07600
      CMP=-NUM*NZ                                                       LEN07610
C     ITERATION TO FIND CORRECT PLACE                                   LEN07620
      CALL FADI                                                         LEN07630
      IF(ICHECK.NE.40)RETURN                                            LEN07640
   40 NP1=N+1                                                           LEN07650
C     INTERNAL RAY LENGTH AND INSIDE SURFACE INTERCEPT                  LEN07660
      AR=(Y2(N)-Y2(NP1))/(X2(N)-X2(NP1))                                LEN07670
      BR=(Y2(N)*X2(NP1)-Y2(NP1)*X2(N))/(X2(N)-X2(NP1))                  LEN07680
      APR=CLP**2+CMP**2-(AR*CKP)**2                                     LEN07690
      BPR=CLP*YC+CMP*ZC-CKP*AR**2*(XC-BR/AR)                            LEN07700
      CPR=YC**2+ZC**2-AR**2*XO*(XO-2.0*BR/AR)-BR**2                     LEN07710
        DEC=BPR**2-APR*CPR                                              LEN07720
        IF(DEC.LT.0.0)GO TO 50                                          LEN07730
      D2=-BPR/APR+ABS(SQRT(DEC)/APR)                                    LEN07740
      XI=CKP*D2+XC                                                      LEN07750
    IF(SQURAY.NE.2)GO TO 89                                             LEN07760
    WRITE(6,87)IZ,XI,D2,APR,BPR,CPR,DEC,BR,AR,CMP,CLP,CKP,NUM,PHIP,PHI LEN07770
   1,RX,RY,RZ,NX,NY,NZ,XC,YO,ZO,RAYY(IZ),RAYZ(IZ)                       LEN07780
   89 CONTINUE                                                          LEN07790
        IF(XI .LT. 0.0 .OR. XI .GT. X2(1)) GO TO 51                     LEN07800
      YI=CLP*D2+YC                                                      LEN07810
      ZI=CMP*D2+ZC                                                      LEN07820
C                                                                       LEN07830
C     DIRECTION COSINES OF INSIDE NORMAL                                LEN07840
      APFUN=SQRT(1.0+AP**2)                                             LEN07850
      YZFUN=SQRT(YI**2+ZI**2)                                           LEN07860
      NXI=-AR/APFUN                                                     LEN07870
      NYI=+YI/(YZFUN*APFUN)                                             LEN07880
      NZI=+ZI/(YZFUN*APFUN)                                             LEN07890
    COTE=NXI*CKP+NYI*CLP+NZI*CMP                                        LEN07900
    IF(COTE.GT.1.0)COTE=1.0                                             LEN07910
    IF(COTE.LT.(-1.0))COTE=-1.0                                         LEN07920
```

```
      IF(SQURAY.NE.2)GO TO 99                                          LEN07930
      WRITE(6,57)YI,ZI,ARFUN,YZFUN,NXI,NYI,NZI,COTE                    LEN07940
   99 CONTINUE                                                         LEN07950
C       ANGLES OF INCIDENCE OF INSIDE SURFACE                          LEN07960
        THETAI=ARCOS(COTE)                                             LEN07970
        PHII=FI-THETAI                                                 LEN07980
C       CHECK FOR TOTAL INTERNAL REFLECTION:                           LEN07990
        TIRA=ARSIN(N3/N2)                                              LEN08000
        IF(PHII .GE. TIRA) GO TO 52                                    LEN08010
        PHIIP=ARSIN(N2/N3*SIN(PHII))                                   LEN08020
      RETURN                                                           LEN08030
   50   ICHECK=50                                                       LEN08040
        RETURN                                                         LEN08050
   51   ICHECK=51                                                       LEN08060
        RETURN                                                         LEN08070
   52   ICHECK=52                                                       LEN08080
   87 FORMAT(1),I2,1IF6.3/3X,14F8.3/)                                  LEN08090
   97 FORMAT(3),8F8.3/)                                                LEN08100
        RETURN                                                         LEN08110
      END                                                              LEN08120
                                                                       LEN08130
       SUBROUTINE INTENS                                               LEN08140
      COMMON/D1/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF           LEN08150
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                       LEN08160
     2,SHAPE,SQURAY,ELLIPS,ICHECK                                      LEN08170
      COMMON/SP/I1(1010),IIP(1010),I2(1010),I2P(1010)                  LEN08180
     1,ETA(101C),X1(101C),Y1(1010),X2(1010),Y2(1010)                   LEN08190
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                              LEN08200
      COMMON/SP/K,L,IZ,IZ1,M,N,NP1,FLAG(1000),IZ0,RAYS,IZ2,DRAYS       LEN08210
     1,ALMBR,CCORD,NUMB,IANGLE,THICK,IZ4,IZ5,CCUNT,IZ6                 LEN08220
     2,CCCK(50C),NUMET,COORT,GAMMA,AB,ONP,STATNA                       LEN08230
     3,RAYY(1000),RAYZ(1000),CENI,TORBI,BUTI,TOPI                      LEN08240
     4,RADIUS,CEN,TOP,BOT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP        LEN08250
     5,AX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                   LEN08260
     6,AFI,NFJ,AFK,THETA,PHI,PHIP,A0,B0,C0,CC,EC,PAR1,PAR2             LEN08270
     7,PAR3,XC,YC,ZC,NUM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI   LEN08280
     8,ALM5,CKPP,CLPP,CMPP,D3,OPL(1000),D1,NUM6,NUM7,NTNCTY(1000)      LEN08290
     9,YIM(100C),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO       LEN08300
      COMMON/SP/NUM8,THETAI,XDIAPT(1000),YDIAPT(1000),SUM1             LEN08310
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)          LEN08320
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)       LEN08330
C                                                                      LEN08340
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                          LEN08350
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,CCUNT,COOR,COORT             LEN08360
      REAL N1,N2,N3                                                    LEN08370
      REAL I1,IIP,I2,I2P                                               LEN08380
     1,AX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                   LEN08390
      REAL NP1,AFJ,AFK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8     LEN08400
     1,NTNCTY                                                          LEN08410
C                                                                      LEN08420
        IF(ICHECK.EC.50)GO TO 50                                       LEN08430
        IF(ICHECK.EC.51)GO TO 51                                       LEN08440
        IF(ICHECK.EC.52)GO TO 52                                       LEN08450
C INSERT CALCULATION OF TRANSMITTED INTENSITY                          LEN08460
C                                                                      LEN08470
           NUM8=COS(PHIIP)-(N2/N3)*COS(PHII)                           LEN08480
C          DIRECTION COSINES OF INSIDE EXTERNAL REFRACTED RAY          LEN08490
           CKPP=(N2/N3)*CKP-NUM8*NXI                                   LEN08500
           CLPP=(N2/N3)*CLP-NUM8*NYI                                   LEN08510
           CMPP=(N2/N3)*CMP-NUM8*NZI                                   LEN08520
C          LENGTH OF INSIDE EXTERNAL REFRACTED RAY                     LEN08530
           D3=(HF-XI)/CKPP                                             LEN08540
           NUM6=((XC+AB)*RX+YC*RY)                                     LEN08550
           NUM7=((XC+AB)*(-RY)+YC*RX)                                  LEN08560
C          LENGTH OF OUTSIDE INCIDENT RAY                              LEN08570
           D1=SQRT((XC-NUM4)**2+(YC-NUM7)**2)                          LEN08580
C          TOTAL OPTICAL PATHLENGTH:                                   LEN08590
           OPL(IZ)=N1*D1+N2*D2+N3*D3                                   LEN08600
C          INTERSECTION WITH THE IMAGE PLANE:                          LEN08610
           YIM(IZ)=((BF-XI)/CKPP)*CLPP+YI                              LEN08620
           ZIM(IZ)=((BF-XI)/CKPP)*CMPP+ZI                              LEN08630
      IF(SQURAY.NE.2)GO TO 99                                          LEN08640
```

```
      WRITE(6,97)IZ,CKF,CLP,CMP,NXI,NYI,NZI,NUM8,CKPP,CLPP,CMPP          LEN08650
     1             ,XI,YI,ZI,XC,YO,RX,RY,BF,NUM6,NUM7                   LEN08660
     2             ,C1,D2,D3,YIM(IZ),ZIM(IZ),PHII,PHIIP                 LEN08670
   95 CONTINUE                                                          LEN08680
      IF(CMPP .LT. 0.000000000001 .AND. CMPP .GT. -0.000000000001)      LEN08690
     1   GO TO 46                                                       LEN08700
         XOIAPT(IZ)=(-ZIM(IZ)/CMPP)*CKPP+AB                             LEN08710
         YOIAPT(IZ)=(-ZIM(IZ)/CMPP)*CLPP+YIM(IZ)                        LEN08720
         GO TO 47                                                       LEN08730
   46 CONTINUE                                                          LEN08740
      XOIAPT(IZ)=99999.                                                 LEN08750
      YOIAPT(IZ)=99999.                                                 LEN08760
   47 CONTINUE                                                          LEN08770
      IF(SQURAY .EQ. 1) WRITE(6,500)IZ,RAYY(IZ),RAYZ(IZ),XO,YO,        LEN08780
     1   XI,YI,ZI,OPL(IZ),YIM(IZ),ZIM(IZ),NTNCTY(IZ),XOIAPT(IZ),       LEN08790
     2   YOIAPT(IZ)                                                     LEN08800
     3   ,PHII,PHIIP,CKPP,CLPP,CMPP,D3,D1,NUM6,NUM7,NUM8                LEN08810
  471  FLAG(IZ)=0                                                       LEN08820
   49 CONTINUE                                                          LEN08830
      IZ1=IZ                                                            LEN08840
      IZ=IZ1+1                                                          LEN08850
      NTNCTY(IZ)=1.0                                                    LEN08860
      RAYY(IZ)=RAYY(IZ1)                                                LEN08870
      RAYZ(IZ)=RAYZ(IZ1)+GRID                                           LEN08880
      IF(FLAG(IZ1) .EQ. 0) COUNT=COUNT+1                                LEN08890
      ICHECK=3                                                          LEN08900
      RETURN                                                            LEN08910
C     END OF RAY TRACE                                                  LEN08920
   50 ICHECK=0                                                          LEN08930
      NTNCTY(IZ)=0.0                                                    LEN08940
      FLAG(IZ)=1                                                        LEN08950
      IF(SQURAY .EQ. 1) WRITE(6,600)IZ,RAYY(IZ),RAYZ(IZ),PHI,PHIP      LEN08960
      GO TO 49                                                          LEN08970
   51 ICHECK=0                                                          LEN08980
      NTNCTY(IZ)=0.0                                                    LEN08990
      FLAG(IZ)=2                                                        LEN09000
      IF(SQURAY .EQ. 1) WRITE(6,700)IZ,RAYY(IZ),RAYZ(IZ),XI             LEN09010
      GO TO 49                                                          LEN09020
   52 ICHECK=0                                                          LEN09030
      NTNCTY(IZ)=0.0                                                    LEN09040
      FLAG(IZ)=3                                                        LEN09050
      IF(SQURAY .EQ. 1) WRITE(6,800)IZ,RAYY(IZ),RAYZ(IZ),PHII,TIRA      LEN09060
      GO TO 49                                                          LEN09070
   97 FORMAT(1X,I2,10F9.5/3X,10F9.5/3X,7F9.5/)                          LEN09080
  500 FORMAT(1X,I4,11F8.5,1X,2E10.3/4X,10F8.4/)                         LEN09090
  600 FORMAT(1X,I4,2F10.7,' NO INTERCEPT WITH 2ND SURFACE; PHI= ',F10.7,LEN09100
     1' ,PHIP= ',F10.7/)                                                LEN09110
  700 FORMAT(1X,I4,2F10.7,' INTERCEPT OUTSIDE BOUNDARY OF 2ND SURFACE; XLEN09120
     1I =',F10.7/)                                                      LEN09130
  800 FORMAT(1X,I4,2F10.7,2X,'TOTAL INTERNAL REFLECTION AT 2ND SURFACE;LEN09140
     1PHII= ',F10.7,' ,TIRA= ',F10.7/)                                  LEN09150
      END                                                               LEN09160
                                                                        LEN09170
      SUBROUTINE IMAGE                                                  LEN09180
      COMMON/DIF/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF           LEN09190
     1,ALFAP,GRID,ELLRAD,ENUM,ELLBF,PI,RAD,ICASE                        LEN09200
     2,SHAPE,SQURAY,ELLIPS,ICHECK                                       LEN09210
      COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)                  LEN09220
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LEN09230
     2,J,UP(1010),DYDXI(1010),DYDXN(1010)                               LEN09240
      COMMON/SK/K,L,IZ,IZ1,M,N,NP1,FLAG(1000),IZ0,RAYS,IZ2,DRAYS        LEN09250
     1,NUMBR,CCORD,NUMP,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                  LEN09260
     2,CCCP(500),NUMPI,COORT,GAMMA,AR,DNP,STATNA                        LEN09270
     3,RAYY(1000),RAYZ(1000),CENI,TORBI,BOTI,TOPI                       LEN09280
     4,RADIUS,CEN,TCP,BCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         LEN09290
     5,AX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN09300
     6,AFI,NPJ,APK,THETA,PEI,PHIP,AO,BO,CO,DO,EO,PAR1,PAR2              LEN09310
     7,PAR3,XC,YO,ZC,NUM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI   LEN09320
     8,NUM5,CKFF,CLPF,CMPP,D3,OPL(1000),D1,NUM6,NUM7,NTNCTY(1000)       LEN09330
     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO        LEN09340
      COMMON/SP/NUMP,THETAI,XOIAPT(1000),YOIAPT(1000),SUM1              LEN09350
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           LEN09360
```

```
     2,ROC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,50)          LEN09370
C                                                                        LEN09380
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                            LEN09390
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT               LEN09400
      REAL N1,N2,N3                                                      LEN09410
      REAL I1,I1P,I2,I2P                                                 LEN09420
     1,AX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                     LEN09430
      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8       LEN09440
     1,NINCTY                                                            LEN09450
C                                                                        LEN09460
C     MIRROR IMAGE RAY MATCHING FOLLOWS                                  LEN09470
C                                                                        LEN09480
   60 CONTINUE                                                           LEN09490
      IF(SQURAY .EQ. 1) WRITE(6,401)                                     LEN09500
      IZC=IZ-1                                                           LEN09510
      IZ2=IZ-120                                                         LEN09520
   61 CONTINUE                                                           LEN09530
      IF(RAYZ(IZ2) .EQ. 0.0) IZ2=IZ2+1                                   LEN09540
         IF(IZ2 .GT. IZC) GO TO 70                                       LEN09550
           FLAG(IZ)=FLAG(IZ2)                                            LEN09560
           IF(FLAG(IZ) .EQ. 0) COUNT=COUNT+1                             LEN09570
           RAYY(IZ)=RAYY(IZ2)                                            LEN09580
           RAYZ(IZ)=-RAYZ(IZ2)                                           LEN09590
           IF(FLAG(IZ2) .GE. 1) GO TO 63                                 LEN09600
             XDIAPT(IZ)=XDIAPT(IZ2)                                      LEN09610
             YDIAPT(IZ)=YDIAPT(IZ2)                                      LEN09620
             YIM(IZ)=YIM(IZ2)                                            LEN09630
             ZIM(IZ)=-ZIM(IZ2)                                           LEN09640
             OPL(IZ)=OPL(IZ2)                                            LEN09650
             NINCTY(IZ)=NINCTY(IZ2)                                      LEN09660
             IF(SQURAY .EQ. 1) WRITE(6,501) IZ,IZ2,RAYY(IZ),RAYZ(IZ),    LEN09670
     1       OPL(IZ),YIM(IZ),ZIM(IZ),NINCTY(IZ),XDIAPT(IZ),YDIAPT(IZ)    LEN09680
   62 CONTINUE                                                           LEN09690
      IZ2=IZ2+1                                                          LEN09700
      IZ=IZ+1                                                            LEN09710
      GO TO 61                                                           LEN09720
   63 CONTINUE                                                           LEN09730
      IF(FLAG(IZ2) .GE. 2) GO TO 64                                      LEN09740
         IF(SQURAY .EQ. 1) WRITE(6,601)IZ,IZ2,RAYY(IZ),RAYZ(IZ)          LEN09750
         GO TO 62                                                        LEN09760
   64 CONTINUE                                                           LEN09770
      IF(FLAG(IZ2) .EQ. 3) GO TO 65                                      LEN09780
         IF(SQURAY .EQ. 1) WRITE(6,701)IZ,IZ2,RAYY(IZ),RAYZ(IZ)          LEN09790
         GO TO 62                                                        LEN09800
   65 CONTINUE                                                           LEN09810
      IF(SQURAY .EQ. 1) WRITE(6,801)IZ,IZ2,RAYY(IZ),RAYZ(IZ)             LEN09820
      GO TO 62                                                           LEN09830
   70 CONTINUE                                                           LEN09840
      RAYS=IZ-1                                                          LEN09850
      DRAYS=RAYS-120                                                     LEN09860
      IF(SQURAY .EQ. 1) WRITE(6,900)RAYS,DRAYS,COUNT                     LEN09870
C                                                                        LEN09880
C     GENERATE OBJECT PLANE ELLIPSES:                                    LEN09890
C                                                                        LEN09900
      IF(ELLIPS .EQ. 1) WRITE(6,1000)ENUM                                LEN09910
      NUMBR=1                                                            LEN09920
      NUMB=1                                                             LEN09930
   71 CONTINUE                                                           LEN09940
      COORD=1                                                            LEN09950
      ELZ(NUMB,COORD)=-YI(NUMBR)                                         LEN09960
   72 CONTINUE                                                           LEN09970
      ELY(NUMB,COORD)=(XI(NUMBR)+AB)*SIN(ALFAP)+SQRT((YI(NUMBR))**2-     LEN09980
     1(ELZ(NUMB,COORD))**2)*COS(ALFAP)                                   LEN09990
      ELZZ=ELZ(NUMB,COORD)                                               LEN10000
      IF(ELLIPS .EQ. 1) WRITE(6,1100)NUMBR,COORD,ELY(NUMB,COORD),        LEN10010
     1ELZ(NUMB,COORD)                                                    LEN10020
      COORD=COORD+1                                                      LEN10030
      ELZ(NUMB,COORD)=ELZZ+ELL                                           LEN10040
      IF(ELZ(NUMB,COORD) .GE. YI(NUMBR)) GO TO 73                        LEN10050
         GO TO 72                                                        LEN10060
   73 CONTINUE                                                           LEN10070
      ELZZ=ELZ(NUMB,COORD)                                               LEN10080
```

```
   74 CONTINUE                                                          LEN10090
      ELZ(NUMB,CCORD)=ELZZ-ELL                                          LEN10100
      IF(ELZ(NCPB,CCORD) .LE. -Y1(NUMBR)) GO TO 75                      LEN10110
      ELY(NUMB,CCORD)=(X1(NUMBR)+AB)*SIN(ALFAP)-SQRT((Y1(NUMBR))**2-    LEN10120
     1(ELZ(NUMB,CCORD))**2)*COS(ALFAP)                                  LEN10130
      ELZZ=ELZ(NUMB,CCORD)                                              LEN10140
      IF(ELLIPS .EQ. 1) WRITE(6,1100)NUMBR,CCORD,ELY(NUMB,CCORD),       LEN10150
     1ELZ(NUMB,CCORD)                                                   LEN10160
      CCCR(NUMB)=CCORD                                                  LEN10170
      CCCRD=CCCRD+1                                                     LEN10180
      GO TO 74                                                          LEN10190
   75 CONTINUE                                                          LEN10200
      NUMBR=NUMBR+(K-1)/ELLNUM                                          LEN10210
      NUMB=NUMB+1                                                       LEN10220
      IF(NUMBR .GT. K) GO TO 76                                         LEN10230
      GO TO 71                                                          LEN10240
   76 CONTINUE                                                          LEN10250
      IF(ELLIPS .EQ. 1) WRITE(6,1200)                                   LEN10260
      NUMBT=NUMB-1                                                      LEN10270
C                                                                       LEN10280
C     IMAGE PLANE SPOT DIAGRAM STATISTICAL ANALYSIS:                    LEN10290
C                                                                       LEN10300
      SUM1=0.0                                                          LEN10310
      DO 77 IZ=1,RAYS                                                   LEN10320
        IF(FLAG(IZ) .GT. 0) GO TO 77                                    LEN10330
          SUM1=YIM(IZ)+SUM1                                             LEN10340
   77 CONTINUE                                                          LEN10350
C     REFERENCE EACH ITERATION TO INCIDENT ANGLE & THICKNESS BY:        LEN10360
      IANGLE=ALFAP*10                                                   LEN10370
      THICK=(T(1))*100                                                  LEN10380
C     CENTROID OF SPOT:                                                 LEN10390
      YCENTR(IANGLE,THICK)=SUM1/COUNT                                   LEN10400
C     STANDARD DEVIATIONS:                                              LEN10410
      SUM2=0.0                                                          LEN10420
      SUM3=0.0                                                          LEN10430
      DO 78 IZ=1,RAYS                                                   LEN10440
        IF(FLAG(IZ) .GT. 0) GO TO 78                                    LEN10450
        SUM2=ZIP(IZ)**2+SUM2                                            LEN10460
        SUM3=(YCENTR(IANGLE,THICK)-YIM(IZ))**2+SUM3                     LEN10470
   78 CONTINUE                                                          LEN10480
      SIGMAZ(IANGLE,THICK)=SUM2/COUNT                                   LEN10490
      SIGMAY(IANGLE,THICK)=SUM3/COUNT                                   LEN10500
C     RMS MEAN SQUARE SPOT SIZE:                                        LEN10510
      RMSRAD(IANGLE,THICK)=SQRT(SIGMAZ(IANGLE,THICK)+SIGMAY(IANGLE,     LEN10520
     1THICK))                                                           LEN10530
  401 FORMAT('1',' MIRROR IMAGE SKEW RAYS FOLLOW'///1X,'IMAGE'/2X,'RAY  RLEN10540
     1AY   RAYY        RAYZ          OPL          YIM          ZIP        NTNCTY  LEN10550
     1      XDIAPT'/81X,'YDIAPT'//)                                    LEN10560
  501 FORMAT(I4,1X,I4,2F10.7,F13.9,3F10.7,E15.3/72X,F15.3/)             LEN10570
  601 FORMAT(I4,1X,I4,2F10.7,' NO INTERCEPT WITH 2ND SURFACE'/)         LEN10580
  701 FORMAT(I4,1X,I4,2F10.7,' INTERCEPT OUTSIDE OF BOUNDARY OF 2ND SUPFLEN10590
     1ACE'/)                                                            LEN10600
  801 FORMAT(I4,1X,I4,2F10.7,' TOTAL INTERNAL REFLECTION'/)             LEN10610
  900 FORMAT(1X,'END OF SKEW RAY TRACE.'//3X,'TOTAL NUMBER OF RAYS TRACELEN10620
     1D = ',I4/3X,'TOTAL NUMBER OF MIRROR IMAGE RAYS = ',I4/3X,'TOTAL NULEN10630
     1MBER OF RAYS STRIKING IMAGE PLANE = ',I4)                         LEN10640
 1000 FORMAT('1',' TWO DIMENSIONAL PROJECTION OF 3-DIM LENS'///3X,'GENERALEN10650
     1TED ELLIPSES ARE REFERENCED TO THE CORRESPONDING JTH COORDINATE  ILEN10660
     1N THE MERIDIAN PLANES AS COMPUTED IN THE ABOVE'/3X,'GLW LENS SHAPELEN10670
     1 ALGORITHM. INSIDE AND OUTSIDE ELLIPSES CORRESPOND TO THE OPAQUE RLEN10680
     1CURVATURES.'/3X,'THE NUMBER OF ELLIPSES GENERATED = ',I3//1X,'   J LEN10690
     1 CCORD      ELY          ELZ'//)                                  LEN10700
 1100 FORMAT(1),I4,4),I4,2F10.7)                                        LEN10710
 1200 FORMAT(1X,'CALCULATION OF ELLIPSE COORDINATES COMPLETE.')         LEN10720
      RETURN                                                            LEN10730
      END                                                               LEN10740
                                                                        LEN10750
      SUBROUTINE SUMM                                                   LEN10760
      COMMON/UTIL/ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),DF            LEN10770
     1,ALFAP,GFID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        LEN10780
     2,SHAPE,SGLRAY,ELLIPS,ICHECK                                       LEN10790
      COMMON/SFP/I1(1010),IIP(1010),I2(1010),I2P(1010)                  LEN10800
```

```
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LEN11510
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               LEN11520
      COMMON/SHAK/K,IZ,IZ1,M,N,NP1,FLAG(1000),IZ1,RAYS,IZZ,DRAYS        LEN11530
     1,ALPHA,COORD,NUMP,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                  LEN11540
     2,COORT(500),NUMBT,COORT,GAMMA,AR,DNP,STATNA                       LEN11550
     3,RAYY(1000),RAYZ(1000),CENI,TORBI,ROTI,TORI                       LEN11560
     4,RADIUS,CEN,TCE,RCI,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         LEN11570
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN11580
     6,API,NPJ,NPK,THETA,PHI,PHIP,A0,B0,C0,DE,EF,PAR1,PAR2              LEN11590
     7,PAR3,XC,YC,ZC,RLP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI    LEN11600
     8,SUM5,CKEP,CLPP,CMPP,U3,OPL(1000),DL,NUM6,NUM7,NTACTY(1000)       LEN11610
     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZDY9        LEN11620
      COMMON/SHP/NUMB,THETA1,XD1APT(1000),YD1APT(1000),SUM1             LEN11630
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           LEN11640
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)        LEN11650
C                                                                       LEN11660
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                           LEN11670
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COMP,COORT              LEN11680
      REAL N1,N2,N3                                                     LEN11690
      REAL II,IIP,I2,I2P                                                LEN11700
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    LEN11710
      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      LEN11720
     1,NTACTY                                                           LEN11730
C                                                                       LEN11740
C WRITE PARAMETER SUMMARY HERE                                          LEN11750
C                                                                       LEN11760
      WRITE(6,1300)T(1),U,ALFAP,R,YCENTR(IANGLE,THICK),                 LEN11770
     1SIGMAY(IANGLE,THICK),SIGMAZ(IANGLE,THICK),RMSRAD(IANGLE,THICK)    LEN11780
C                                                                       LEN11790
C     SPOT DIAGRAM ENERGY DENSITY VS. RADIUS FROM CENTROID:             LEN11800
C                                                                       LEN11810
      DO 79 IZ=1,RAYS                                                   LEN11820
        IF(FLAG(IZ) .GT. 0) GO TO 79                                    LEN11830
        SDRAD(IZ)=SQRT((YCENTR(IANGLE,THICK)-YIM(IZ))**2+ZIM(IZ)**2)    LEN11840
   79 CONTINUE                                                          LEN11850
      IZ4=1                                                             LEN11860
      RCC(IZ4)=0.005                                                    LEN11870
      SUM4(IZ4)=0.0                                                     LEN11880
   80 CONTINUE                                                          LEN11890
      DO 81 IZ=1,RAYS                                                   LEN11900
        IF(FLAG(IZ) .GT. 0) GO TO 81                                    LEN11910
        IF(SDRAD(IZ) .LE. RCC(IZ4)) SUM4(IZ4)=1+SUM4(IZ4)               LEN11920
   81 CONTINUE                                                          LEN11930
      FRACTN(IZ4)=SUM4(IZ4)/RAYS                                        LEN11940
      WRITE(6,1400) IZ4,RCC(IZ4),FRACTN(IZ4)                            LEN11950
      IZ5=IZ4                                                           LEN11960
      IZ4=IZ4+1                                                         LEN11970
      RCC(IZ4)=RCC(IZ5)+0.005                                           LEN11980
      SUM4(IZ4)=0.0                                                     LEN11990
      IF(RCC(IZ4) .GT. 0.5) GO TO 82                                    LEN12000
      GO TO 80                                                          LEN12010
   82 CONTINUE                                                          LEN12020
      IZ6=IZ4-1                                                         LEN12030
      WRITE(6,1500)                                                     LEN12040
 1300 FORMAT('1',1X,'IMAGE PLANE SPOT DIAGRAM ANALYSIS:'///1X,'THICKNESSLEN12050
     1 =',F9.7,'  U =',F9.7,'  ALFAP =',F9.7,'  R =',F9.7//1X,'CENTROID:LEN12060
     1 ZCENTR = 0.0,  YCENTR = ',F10.7//1X,'STANDARD DEVIATIONS:  SIGMAYLEN12070
     1 = ',F10.7,2X,'SIGMAZ = ',F10.7//1X,'RMS SPOT SIZE: RMSRAD = ',  LEN12080
     1F10.7///1X,'SPOT DIAGRAM ENERGY DENSITY VS. RADIUS FROM CENTROID:'LEN12090
     1//1X,' IZ4    RADIUS    FRACTION'//)                             LEN12100
 1400 FORMAT(I4,2F11.7)                                                 LEN12110
 1500 FORMAT(1X,'SPOT DIAGRAM CALCULATIONS COMPLETE.')                  LEN12120
      RETURN                                                            LEN12130
      END                                                               LEN12140
                                                                        LEN12150
      SUBROUTINE PLOTT                                                  LEN12160
      COMMON/OUT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF           LEN12170
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        LEN12180
     2,SHAPE,SQURAY,ELLIPS,ICHECK                                       LEN12190
      COMMON/SHP/II(1010),IIP(1010),I2(1010),I2P(1010)                  LEN12200
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    LEN12210
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               LEN12220
```

```
      COMMON/SP/K,I,IZ,IZ1,M,N,NPI,FLAG(1003),IZ4,RAYS,IZ2,IRAYS          LEN11530
     1,NUMAR,CCORD,NUMB,IANGLE,THICK,IZ4,IZ5,COUNT,IZA                    LEN11540
     2,CCCR(500),NUMBT,COORT,GAMMA,AP,UNP,STATNA                          LEN11550
     3,RAYY(1000),RAYZ(1000),CENI,TORAI,DOTI,TCPI                         LEN11560
     4,RADIUS,CEN,TCP,PCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP           LEN11570
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                      LEN11580
     6,NPI,NPJ,NPK,THETA,PHI,PHIP,AO,BO,CO,DC,EC,PAR1,PAR2               LEN11590
     7,PAR3,XC,YO,ZC,NUM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI     LEN11600
     8,ALM5,CKEP,CLPE,CAPP,D3,OPL(1000),DI,NUM6,NUM7,NTNCTY(1000)         LEN11610
     9,YIM(1000),ZIM(1000),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZDYO          LEN11620
      COMMON/SP/NUMB,THETAI,XDIAPT(1000),YDIAPT(1000),SUM1                LEN11630
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)             LEN11640
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1000),YCENTR(20,500)          LEN11650
C                                                                         LEN11660
      INTEGER ELLNUM,EXUM,SHAPE,SQURAY,ELLIPS                             LEN11670
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT                LEN11680
      REAL N1,N2,N3                                                       LEN11690
      REAL II,IIP,I2,I2P                                                  LEN11700
     1,AX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                      LEN11710
      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8        LEN11720
     1,NTNCTY                                                             LEN11730
C                                                                         LEN11740
CCC   PLOT OUTPLT                                                         LEN11750
CCCC                                                                      LEN11760
CCCC  WRITE OUTPUT FOR PLOT INTO FILE FT01F001                            LEN11770
CCCC                                                                      LEN11780
C                                                                         LEN11790
      WRITE(1,83)F,ALPHA,U,I,R,T(1),N1,N2,N3,ALFAP,GRID,STATNA,GAMMA      LEN11800
     1,RAYS,COUNT,K,IZ6,IANGLE,THICK                                      LEN11810
   83 FORMAT(' ',3F9.7,I4,4F9.7/' ',3F9.7,F9.5,F9.7/' ',6I4)              LEN11820
      DO 85 J=1,K                                                         LEN11830
         WRITE(1,84)X1(J),Y1(J),X2(J),Y2(J)                               LEN11840
   84    FORMAT(' ',4F10.7)                                               LEN11850
   85 CONTINUE                                                            LEN11860
      DO 88 IZ=1,RAYS                                                     LEN11870
         WRITE(1,86)RAYY(IZ),RAYZ(IZ),FLAG(IZ)                            LEN11880
   86    FORMAT(' ',2F10.7,3X,I1)                                         LEN11890
         IF(FLAG(IZ) .GT. 0) GO TO 88                                     LEN11900
           WRITE(1,87)YIM(IZ),ZIM(IZ)                                     LEN11910
   87      FORMAT(' ',2F10.7)                                             LEN11920
   88 CONTINUE                                                            LEN11930
      DO 90 IZ4=1,IZ6                                                     LEN11940
         WRITE(1,89)RCC(IZ4),FRACTN(IZ4)                                  LEN11950
   89    FORMAT(' ',F10.7,2X,F10.7)                                       LEN11960
   90 CONTINUE                                                            LEN11970
      WRITE(1,91)YCENTR(IANGLE,THICK),SIGMAY(IANGLE,THICK),               LEN11980
     1SIGMAZ(IANGLE,THICK),RMSRAD(IANGLE,THICK),NUMBT                     LEN11990
   91 FORMAT(' ',4F10.7,I4)                                               LEN12000
      DO 96 NUMB=1,NUMBT                                                  LEN12010
         WRITE(1,92)CCCR(NUMB)                                            LEN12020
   92    FORMAT(' ',I3)                                                   LEN12030
         COORT=COOR(NUMB)                                                 LEN12040
         DO 95 COORD=1,COORT                                              LEN12050
            WRITE(1,94)ELY(NUMB,COORD),ELZ(NUMB,COORD)                    LEN12060
   94       FORMAT(' ',F11.8,3X,F11.8)                                    LEN12070
   95    CONTINUE                                                         LEN12080
   96 CONTINUE                                                            LEN12090
      WRITE(1,97)                                                         LEN12100
   97 FORMAT(' ','/*')                                                    LEN12110
      WRITE(6,98)                                                         LEN12120
   98 FORMAT(' ','TO OBTAIN PLOTS FROM THE PLOTTER OR THE PRINTER,'/' ',  LEN12130
     1'ISSUE THE FOLLOWING COMMAND: '/' ',8X,'FOR PRINTER PLOTS',          LEN12140
     1T36,'ENTER "LENSCOM PRINTER"'/' ',8X,'FOR PLOTTER GRAPHS',T36,      LEN12150
     1'ENTER "LENSCOM PLOTTER"')                                          LEN12160
      WRITE(6,99)                                                         LEN12170
   99 FORMAT(' ','END OF PROGRAM')                                        LEN12180
      RETURN                                                              LEN12190
      END                                                                 LEN12200
```

## 9.1 PLOT ROUTINES

```
//AMIC3250 JOB (3250,0C89),'AMICHAI',CLASS=A                                    LEN00010
// EXEC   FRTXCLGP                                                              LEN00020
//FORT.SYSIN  DD  *                                                            LEN00030
C                                                                              LEN00040
C      SPECIFICATION STATEMENTS                                                LEN00050
C                                                                              LEN00060
      INTEGER I,RAYS,CCUNT,IZ6,IZ4,IANGLE,THICK,IZ,NUMB,NUMBT                  LEN00070
     1,CCOR(50C),FLAG(1000),K,J,GP,GPP,COORD,COORT,ALLELL,KK,KKK,JJ            LEN00080
C                                                                              LEN00090
      REAL F,ALPHA,U,R,T(1010),N1,N2,N3,ALFAP,GRID,STATNA,GAMMA,X1(1010)       LEN00100
     1,Y1(1010),X2(1010),Y2(1010),RAYY(1000),RAYZ(1000),YIM(1000)              LEN00110
     2,ZIM(10CC),RCC(300),FRACTN(300),YCENTR(20,500),SIGMAY(10,500)            LEN00120
     3,SIGMAZ(10,500),RMSRAD(10,500),ELY(7,1000),ELZ(7,1000)                   LEN00130
     4,YIMAGE(1000),ZIMAGE(1000),X(2020),Y(2020)                               LEN00140
C                                                                              LEN00150
      READ(5,1C0)F,ALPHA,U,I,R,T(I),N1,N2,N3,ALFAP,GRID,STATNA,GAMMA           LEN00160
     1,RAYS,CCLAT,K,IZ6,IANGLE,THICK,XC,DIV                                    LEN00170
  100 FORMAT(1),3F9.7,I4,4F9.7/1X,3F9.7,F9.5,F9.7/1X,6I4,2F8.5)                LEN00180
      DO 300 J=1,K                                                             LEN00190
         READ(5,200)X1(J),Y1(J),X2(J),Y2(J)                                    LEN00200
  200    FORMAT(1X,4F10.7)                                                     LEN00210
  300 CONTINUE                                                                 LEN00220
      DO 310 J=1,K                                                             LEN00230
         X(J)=X1(J)                                                            LEN00240
         Y(J)=Y1(J)                                                            LEN00250
  310    CONTINUE                                                              LEN00260
      KK=K+1                                                                   LEN00270
      KKK=2*K                                                                  LEN00280
      DO 320 J=KK,KKK                                                          LEN00290
         JJ=J-K                                                                LEN00300
         X(J)=X2(JJ)                                                           LEN00310
         Y(J)=Y2(JJ)                                                           LEN00320
  320 CONTINUE                                                                 LEN00330
      X(J)=STATNA                                                              LEN00340
      Y(J)=0.0                                                                 LEN00350
      J=J+1                                                                    LEN00360
      X(J)=F/R                                                                 LEN00370
      Y(J)=0.0                                                                 LEN00380
      GP=1                                                                     LEN00390
      DO 600 IZ=1,RAYS                                                         LEN00400
         READ(5,400)RAYY(IZ),RAYZ(IZ),FLAG(IZ)                                 LEN00410
  400    FORMAT(1X,2F10.7,3X,I1)                                               LEN00420
         IF(FLAG(IZ) .GT. 0) GO TO 600                                         LEN00430
           READ(5,500)YIM(IZ),ZIM(IZ)                                          LEN00440
  500      FORMAT(1X,2F10.7)                                                   LEN00450
           YIMAGE(GP)=YIM(IZ)                                                  LEN00460
           ZIMAGE(GP)=ZIM(IZ)                                                  LEN00470
           GPP=GP                                                              LEN00480
           GP=GP+1                                                             LEN00490
  600 CONTINUE                                                                 LEN00500
      DO 800 IZ4=1,IZ6                                                         LEN00510
         READ(5,700)RCC(IZ4),FRACTN(IZ4)                                       LEN00520
  700    FORMAT(1X,F10.7,2X,F10.7)                                             LEN00530
  800 CONTINUE                                                                 LEN00540
      READ(5,900)YCENTR(IANGLE,THICK),SIGMAY(IANGLE,THICK),                    LEN00550
     1SIGMAZ(IANGLE,THICK),RMSRAD(IANGLE,THICK),NUMBT                          LEN00560
  900 FORMAT(1X,4F11.7,I4)                                                     LEN00570
      ALLELL=0                                                                 LEN00580
      DO 1400 NUMB=1,NUMBT                                                     LEN00590
         READ(5,1150)CCOR(NUMB)                                                LEN00600
 1150    FORMAT(1X,I3)                                                         LEN00610
         COORT=CCOR(NUMB)                                                      LEN00620
         ALLELL=ALLELL+COORT                                                   LEN00630
         DO 1300 COORD=1,COORT                                                 LEN00640
            READ(5,1200)ELY(NUMB,COORD),ELZ(NUMB,COORD)                        LEN00650
 1200       FORMAT(1X,F11.8,3X,F11.8)                                          LEN00660
 1300    CONTINUE                                                              LEN00670
 1400 CONTINUE                                                                 LEN00680
      WRITE(6,1500)                                                            LEN00690
 1500 FORMAT('1',' SUMMARY OF RESULTS'///)                                     LEN00700
      WRITE(6,1600) F,ALPHA,U,I,R,T(I),N1,N2,N3,ALFAP,GRID,STATNA,GAMMA,       LEN00710
     1XC,DIV,RAYS,CCLAT,YCENTR(IANGLE,THICK),SIGMAY(IANGLE,THICK),            LEN00720
```

```
     1SIGMAZ(IANGLE,THICK),RMSRAD(IANGLE,THICK)                          LEN00730
 1600 FORMAT('0','FOCAL LENGTH = ',F5.7,2X,'ALPHA = ',F9.7,2X,'U = ',    LEN00740
     1F5.7,2X,'I = ',I4//'0','R = ',F9.7,2X,'T = ',F9.7,2X,'INDICES OF R LEN00750
     1EFRACTION ARE: N1 = ',F9.7,2X,'N2 = ',F9.7,2X,'N3 = ',F9.7//'0',   LEN00760
     1'ALPAP = ',F9.7,2X,'GRID = ',F9.7,2X,'STATNA = ',F9.5,2X,'GAMMA = ' LEN00770
     1',F9.7,2X,'XC=',F7.5,2X,'DIV=',F7.5,                               LEN00780
     1//'0','RAYS = ',I4,2X,'COUNT = ',I4,2X,'YCENTR = ',F10.7,          LEN00790
     12X,'SIGMAY =',F10.7,2X,'SIGMAZ =',F10.7//'0','RMSRAD =',F10.7)     LEN00800
      WRITE(6,1700)                                                      LEN00810
 1700 FORMAT('1',48X,'GLM LENS SHAPE'/)                                  LEN00820
      CALL PLOTP(X,Y,J,4)                                                LEN00830
      WRITE(6,1800)                                                      LEN00840
 1800 FORMAT('1',48X,'OBJECT PLANE'/)                                    LEN00850
      ALLELL=2*ALLELL+ALLELL/2                                           LEN00860
      CALL PLOTP(ELZ,ELY,ALLELL,4)                                       LEN00870
      WRITE(6,1500)                                                      LEN00880
 1500 FORMAT('1',48X,'IMAGE PLANE'/)                                     LEN00890
      CALL PLOTP(ZIMAGE,YIMAGE,GPP,4)                                    LEN00900
      WRITE(6,2000)                                                      LEN00910
 2000 FORMAT('1',36X,'ENERGY DENSITY VS. RADIUS FROM CENTROID'/)         LEN00920
      CALL PLOTP(ROC,FRACTN,126,4)                                       LEN00930
      STOP                                                               LEN00940
      END                                                                LEN00950
/*                                                                       LEN00960
//GO.SYSIN  DD  *                                                        LEN00970
```

```
&CONTROL ERROR
&IF .&1 EQ .PRINTER &GOTO -PRINTER
&IF .&1 EQ .PLOTTER &GOTO -PLOTTER
&TYPE REPEAT. SPECIFY PRINTER OR PLOTTER.
&EXIT
-PRINTER &CONTINUE
&NAME = LEASPLOT
&GOTO -CC
-PLOTTER &CONTINUE
&NAME = LEASGRAF
-CC &CONTINUE
COPYFILE &NAME FORTRAN A FILE FT01F001 A PLOT FORTRAN A (REPLACE
EXEC SUBMIT PLOT FORTRAN
```

## 10. PROGRAM GRIN - LISTING

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C                        PROGRAM GRIN
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF
     1,ALFAP,GFIC,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE
      COMMON/PI/SHAPE,SQURAY,ELLIPS,ICHECK
      COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)
     2,J,UP(1010),DYCXT(1010),DYDXN(1010)
        COMMON/IN/AN2,BN2,XC,DIV,E,THETAE,RO
        COMMON/GN/RR(1010),RF(1010),THETAO,TOTF,PSI,PSIO
        COMMON/RA/BR1,BR2
        COMMON/DET/A1,A2,A3,B1,B2,B3,C1,C2,C3
        COMMON/DIR/RRX,RRY,RRZ,NPFX,NPFY,NPFZ,PSIR
        COMMON/RN2/PRF,PF1
        COMMON/IT/ILCOP
      COMMON/SK/K,L,IZ,IZ1,M,N,NP1,FLAG(1010),IZO,RAYS,IZ2,DRAYS
     1,NUMBR,COORD,NUMB,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6
     2,CCCR(500),NUMET,COORT,GAMMA,AB,ONP,STATNA
     3,RAYY(1010),RAYZ(1010),CENI,TORBI,ROTI,TCPI
     4,RADIUS,CEN,TCP,BCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA
     6,NPI,NPJ,NPK,THETA,PHI,PHIP,AU,BO,CO,DC,EC,PAR1,PAR2
     7,PAR3,XC,YO,ZC,NUM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI
     8,NUM5,CKPP,CLPP,CMPP,D3,DPL(1010),DI,NUM6,NUM7,NTNCTY(1010)
     9,YIM(1010),ZIM(1010),ELL,ELY(7,1010),ELZ(7,1010),ELZZ,ZOYO
      COMMON/SM/NUMB,THETAI,XCIAPT(1010),YCIAPT(1010),SUM1
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)
     2,RCC(3000),SUM4(3000),FRACTN(3000),SDRAD(1010),YCENTR(20,500)
C
       INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS
       INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT
       REAL N1,N2,N3
       REAL I1,I1P,I2,I2P
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA
       REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUMB
     1,NTNCTY
       REAL NPFX,NPFY,NPFZ
C
       CALL DATTA
       ICHECK=0
       K=I+1
       DO 10 J=1,K
       IF(J.GT.1)BETA(J)=BETA(1)-(J-1)*DLB
       IF(ICASE.EQ.1)CALL SHAPEC
       IF(ICASE.EQ.2)CALL SHAPET
       IF(J.GT.1)GO TO 5
       CLB=BETA(1)/I
       WRITE(6,100) ICASE,ALPHA,BETA(1),R,U,I,T(1),N1,N2,N3,BF,DLB
     1              ,XC,DIV,ALFAP
    5  IF(SHAPE.EQ.0)GO TO 10
       WRITE(6,200)J,X1(J),Y1(J),X2(J),Y2(J),BETA(J),I2P(J),I2(J),
     1 ETA(J),T(J),I1P(J),I1(J),DYCXT(J)
     2 ,E,THETAE,THETAO,PSI,PSIO,RR(J),RF(J)
   10 CONTINUE
         CALL NOSE
   20 CALL ZOYC
         IF(ICASE.GT.1)GO TO 25
         CALL FACI
         IF(ICHECK.EQ.20)GO TO 20
         IF(ICHECK.EQ.40)CALL SKEWC
         IF(ICHECK.EQ.60)GO TO 60
         GO TO 50
   25 CALL SKEWT
         IF(ICHECK.EQ.20)GO TO 20
         IF(ICHECK.EQ.60)GO TO 60
   50 CALL INTENS
         IF(ICHECK.EQ.30)GO TO 20
         STOP
   60 CALL IMAGE
```

```
      CALL SUMM                                                          GRIN00730
      CALL PLOTT                                                         GRIN00740
  100 FORMAT('0',' GRIN PARAMETERS(',I1,'):'///5X,'ALPHA = ',F9.7,2X,GRIN00750
     1'BETA = ',F9.7,2X,'RADIUS = ',F7.5,2X,'INCIDENT ANGLE = ',        GRIN00760
     2F5.6,2X,'ITERATIONS = ',I5//5X,'EDGE THICKNESS = ',F9.7,2X,       GRIN00770
     3'INDICES OF REFRACTION: N1 = ',F7.5,2X,'N2 = ',F7.5,2X,'N3 = ',   GRIN00780
     4F7.5//5X,'FOCAL LENGTH FROM STATION ZERO = ',F7.5,2X,             GRIN00790
     5'DELTA BETA= ',F7.5//5X,'CENTER OF SYM(XC)=',F8.5,2X,             GRIN00800
     6'CHANGE IN N2(1)=',F6.3,2X,'ALFAP=',F6.3//5X,                     GRIN00810
     7'NOTE:X-COORDINATES HAS BEEN SHIFTED IN CASE=2 BY X2(K);NOW,X2(K)=GRIN00820
     80.0 ETC.'///                                                      GRIN00830
     1X,' J X1 Y1 X2 Y2 BETA I2PGRIN00840
     2 I2 ETA T IIP II DYDXT'/ GRIN00850
     3,7X,'E',5X,'THETAE',4X,'THETAO',4X,'PSI',7X,'PSIO',6X,            GRIN00860
     4'RR',8X,'RF'//)                                                   GRIN00870
  200 FORMAT(1X,I4,I2F10.7/5X,7F10.7)                                   GRIN00880
      STOP                                                              GRIN00890
      END                                                               GRIN00900
                                                                        GRIN00910
      SUBROUTINE DATTA                                                  GRIN00920
        COMMON/ET/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF          GRIN00930
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        GRIN00940
        COMMON/P1/SHAPE,SQURAY,ELLIPS,ICHECK                            GRIN00950
        COMMON/SHP/II(1010),IIP(1010),I2(1010),I2P(1010)                GRIN00960
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    GRIN00970
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               GRIN00980
        COMMON/IN/AN2,BN2,XC,CIV,E,THETAE,RO                            GRIN00990
        COMMON/SK/K,L,IZ,IZI,M,N,NP1,FLAG(1010),IZO,RAYS,IZ2,DRAYS      GRIN01000
     1,KLMBP,CCORD,KLMP,IANGLE,THICK,IZ4,IZ5,CCUNT,IZ6                  GRIN01010
     2,COOR(500),NUMBT,COORT,GAMMA,AB,ONP,STATNA                        GRIN01020
     3,RAYY(1010),RAYZ(1010),CENI,TORBT,BOTI,TOPI                       GRIN01030
     4,RADIUS,CEN,TOP,BOT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         GRIN01040
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRIN01050
     6,API,NPJ,APK,THETA,PHI,PHIP,AO,BO,CO,DO,EO,PAR1,PAR2              GRIN01060
     7,PAR3,XC,YO,ZC,KLM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI    GRIN01070
     8,NUM5,CKEF,CLPF,CMPP,D3,OPL(1010),DI,NUM6,NUM7,NTNCTY(1010)       GRIN01080
     9,YIM(1010),ZIM(1010),FIL,FLY(7,1000),ELZ(7,1000),ELZZ,ZOYO        GRIN01090
        COMMON/SM/NUME,THETAI,XOIAPT(1010),YOIAPT(1010),SUM1            GRIN01100
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           GRIN01110
     2,RLC(300),SUM4(300),FRACTN(300),SDRAD(1010),YCENTR(20,500)        GRIN01120
C                                                                       GRIN01130
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                           GRIN01140
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,CCUNT,COOR,COORT              GRIN01150
      REAL N1,N2,N3                                                     GRIN01160
      REAL II,IIP,I2,I2P                                                GRIN01170
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRIN01180
      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      GRIN01190
     1,NTNCTY                                                           GRIN01200
C                                                                       GRIN01210
C     F IS THE FOCAL LENGTH                                             GRIN01220
C     ALPHA IS THE INSIDE SURFACE CONE HALF ANGLE                       GRIN01230
C        (ALFA IS IN DEG.,ALPHA IS IN RAD.)                             GRIN01240
C     U IS THE INCIDENT RAY OFFSET ANGLE                                GRIN01250
C     ICASE CHOOSES WHETHER THE CONE IS THE FRONT SURFACE(1,ICASE=1)    GRIN01260
C                                  OR THE REAR SURFACE(2,ICASE=2)       GRIN01270
C     I IS THE NUMBER OF ITERATIONS(MUST BE AN EVEN INTEGER)            GRIN01280
C     R IS THE MAXIMUM RADIUS OF INSIDE SURFACE CONE                    GRIN01290
C     T IS THE THICKNESS OF LENS AT THE EDGE                            GRIN01300
C     N1,N2,N3 ARE THE INDICES OF REFRACTIONS                           GRIN01310
    1 READ (5,*) F,ALFA,U,ICASE                                         GRIN01320
    2 READ (5,*) I,R,T(1)                                               GRIN01330
    3 READ (5,*) N1,N2,N3                                               GRIN01340
      T(1)=T(1)/R                                                       GRIN01350
      PI=ATAN(1.0)*4.0                                                  GRIN01360
      RAD=PI/180.0                                                      GRIN01370
      ALPHA=ALFA*RAD                                                    GRIN01380
C                                                                       GRIN01390
C     INPUT KNOWNS FOR TRACE RAY:                                       GRIN01400
C     ALFAP IS THE INCLINATION OF OBJECT PLANE(RADIANS)                 GRIN01410
C     GRID IS THE SIZE OF GRID INCREMENT                                GRIN01420
C     ELLNUM :  THE NUMBER OF ELLIPSES=ENUM;ELLNUM MUST BE EVEN         GRIN01430
C               AND IF ELLNUM MUST BE AN INTEGER WITH NO REMAINDER      GRIN01440
```

```
C       ELL IS THE Z COORDINATE INCREMENT FOR ELLIPSE PLOTS                    GRI01450
    4   READ (5,*) ALFAP,GRID,ELLNUM                                          GRI01460
        ENUM=ELLNUM+1                                                          GRI01470
        ELL=GRID/5.0                                                           GRI01480
        BF=F/R                                                                 GRI01490
C                                                                              GRI01500
C           INPUT FOR GRIN                                                     GRI01510
C           XC IS THE LOCATION OF CENTER,DIV IS THE CHANGE IN N2(B)            GRI01520
    5       READ (5,*) XC,DIV                                                  GRI01530
            AN2=N2**2                                                          GRI01540
            BN2=AN2*((1.0+DIV)**2-1.0)                                         GRI01550
            IF(XC.GE.(-.01)GO TO 10                                            GRI01560
C                                                                              GRI01570
CCC     OUTPUT OPTIONS:                                                        GRI01580
CCC     TO HAVE LENS SHAPE DATA PRINTED SET "SHAPE" TO 1. OTHERWISE            GRI01590
C       SET "SHAPE"=0                                                          GRI01600
CCC     TO HAVE SKEW RAY AND MIRROR IMAGE SKEW RAY DATA OUTPUT SET             GRI01610
CCC     "SQURAY" TO 1. ELSE SET "SQURAY" TO 0. (INTEGER)                       GRI01620
CCC     "SQURAY",EG.2 OR 3 GIVES DIFFERENT PRINTS FOR ANALYSIS.                GRI01630
CCC     TO HAVE ELLIPSE SHAPE DATA PRINTED SET "ELLIPS" TO 1. OTHERWISE        GRI01640
C       SET "ELLIPS" = 0                                                       GRI01650
    6   READ (5,*) SHAPE,SQURAY,ELLIPS                                        GRI01660
        RETURN                                                                 GRI01670
   10   WRITE(6,20)                                                            GRI01680
   20   FORMAT(5X,'SORRY;TAKE XC.LT.0.0')                                      GRI01690
        STOP                                                                   GRI01700
        END                                                                    GRI01710
                                                                               GRI01720
        SUBROUTINE SHAPEC                                                      GRI01730
C       WILL BE ADDED IN CAPT. CARR'S THESIS                                   GRI01740
        STOP                                                                   GRI01750
        END                                                                    GRI01760
                                                                               GRI01770
        SUBROUTINE SHAPET                                                      GRI01780
         COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF                GRI01790
       1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                             GRI01800
        COMMON/PT/SHAPE,SQURAY,ELLIPS,ICHECK                                   GRI01810
         COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)                      GRI01820
       1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                         GRI01830
       2,J,UP(1010),DYDXT(1010),DYDXN(1010)                                    GRI01840
          COMMON/IN/AN2,BN2,XC,DIV,E,THETAE,PO                                 GRI01850
          COMMON/GN/RR(1010),RF(1010),THETA0,TOTE,PSI,PSI0                     GRI01860
          COMMON/FA/B1,B2                                                      GRI01870
        REAL N1,N2,N3                                                          GRI01880
        REAL I1,I1P,I2,I2P                                                     GRI01890
       1,AX,AY,AZ,PX,RY,RZ,AXI,AYI,AZI,PHII,PHIIP,TIRA                         GRI01900
C                                                                              GRI01910
        IF(J.GT.1)GO TO 13                                                     GRI01920
        CALL INIT                                                              GRI01930
        GO TO 15                                                               GRI01940
C       ASSUME THETAE(J)=THETAE(J-1)                                           GRI01950
   13   THETAE=THETAE*1.005                                                    GRI01960
        KITER=0                                                                GRI01970
   15   CALL POINTS                                                            GRI01980
        CALL EPENT                                                             GRI01990
C       ITERATION ROUTINE TO FIND CORRECT THETAE                               GRI02000
        IF(KITER.EQ.0)CALL ITER                                                GRI02010
        IF(KITER.EQ.1)GO TO 17                                                 GRI02020
        KITER=1                                                                GRI02030
        GO TO 15                                                               GRI02040
C       SLOPES OF NORMAL AND TANGENTIAL(SURFACE)                               GRI02050
   17   CALL INDEX(RR(J),RF(J),N2)                                             GRI02060
        PSI0=ARSIN(E/(N2*RR(J)))                                               GRI02070
        CALL REAP                                                              GRI02080
   19   DYDXT(J)=COTAN(ETA(J))                                                 GRI02090
        DYDXN(J)=-TAN(ETA(J))                                                  GRI02100
        RETURN                                                                 GRI02110
        END                                                                    GRI02120
                                                                               GRI02130
        SUBROUTINE INIT                                                        GRI02140
         COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF                GRI02150
       1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                             GRI02160
```

```
      COMMON/PT/SHAPE,SCURAY,ELLIPS,ICHECK                              GRI02170
       COMMON/SHP/II(1010),IIP(1010),I2(1010),I2P(1010)                 GRI02180
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    GRI02190
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               GRI02200
       COMMON/IN/AN2,EN2,XC,DIV,E,THETAE,RO                             GRI02210
       COMMON/GN/RR(1010),RF(1010),THETAO,TOTE,PSI,PSIO                 GRI02220
       COMMON/RA/R1,R2                                                  GRI02230
C                                                                       GRI02240
      REAL N1,N2,N3                                                     GRI02250
      REAL II,IIP,I2,I2P                                                GRI02260
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRI02270
C                                                                       GRI02280
      Y1(1)=R                                                           GRI02290
      X1(1)=R/TAN(ALPHA)                                                GRI02300
        IF(X1(1).NE.XC)GO TO 15                                         GRI02310
        TOTE=PI/2.0                                                     GRI02320
        GO TO 17                                                        GRI02330
   15 TOTE=ATAN(R/(X1(1)-XC))                                           GRI02340
   17 RF(1)=R/SIN(TOTE)                                                 GRI02350
      THETAE=T(1)/RF(1)                                                 GRI02360
      THETAO=TOTE-THETAE                                                GRI02370
        RO=RF(1)                                                        GRI02380
C       THIS WILL FIX RO=CONSTANT THROUGH THAT RUN.                     GRI02390
      CALL FRONT                                                        GRI02400
      CALL RADAR(RR(1),RF(1),-1.0)                                      GRI02410
      CALL INDEX(RR(1),RF(1),N2)                                        GRI02420
      PSIO=ARSIN(E/(N2*RR(1)))                                          GRI02430
      Y2(1)=RR(1)*SIN(THETAO)                                           GRI02440
      X2(1)=XC+RR(1)*COS(THETAO)                                        GRI02450
      BETA(1)=ATAN(Y2(1)/(BF-X2(1)))                                    GRI02460
      CALL REAF                                                         GRI02470
      RETURN                                                            GRI02480
      END                                                               GRI02490
                                                                        GRI02500
      SUBROUTINE POINTS                                                 GRI02510
       COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF           GRI02520
     1,ALFAP,GFID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        GRI02530
       COMMON/PT/SHAPE,SCURAY,ELLIPS,ICHECK                             GRI02540
       COMMON/SHP/II(1010),IIP(1010),I2(1010),I2P(1010)                 GRI02550
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    GRI02560
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               GRI02570
       COMMON/IN/AN2,EN2,XC,DIV,E,THETAE,RO                             GRI02580
       COMMON/GN/RR(1010),RF(1010),THETAO,TOTE,PSI,PSIO                 GRI02590
C                                                                       GRI02600
      REAL N1,N2,N3                                                     GRI02610
      REAL II,IIP,I2,I2P                                                GRI02620
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRI02630
C                                                                       GRI02640
      BPF=Y2(J-1)*(-DYDXN(J-1)+COTAN(BETA(J-1)))                        GRI02650
      X2(J)=(BF*(TAN(BETA(J))+DYDXT(J-1))-DYDXT(J-1)*BPF)               GRI02660
     1/(DYDXT(J-1)+TAN(BETA(J)))                                        GRI02670
      Y2(J)=TAN(BETA(J))*(-X2(J)+BF)                                    GRI02680
      RR(J)=SQRT((X2(J)-XC)**2+Y2(J)**2)                                GRI02690
        IF(X2(J).NE.XC)GO TO 15                                         GRI02700
        THETAO=PI/2.0                                                   GRI02710
        GO TO 17                                                        GRI02720
   15 THETAO=ATAN(Y2(J)/(X2(J)-XC))                                     GRI02730
   17 TOTE=THETAE+THETAO                                                GRI02740
      X1(J)=(XC*TAN(TOTE))/(TAN(TOTE)-TAN(ALPHA))                       GRI02750
      Y1(J)=X1(J)*TAN(ALPHA)                                            GRI02760
      RF(J)=Y1(J)/SIN(TOTE)                                             GRI02770
      T(J)=SQRT((X2(J)-X1(J))**2+(Y1(J)-Y2(J))**2)                      GRI02780
      RETURN                                                            GRI02790
      END                                                               GRI02800
                                                                        GRI02810
      SUBROUTINE FRONT                                                  GRI02820
       COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF           GRI02830
     1,ALFAP,GFID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        GRI02840
       COMMON/PT/SHAPE,SCURAY,ELLIPS,ICHECK                             GRI02850
       COMMON/SHP/II(1010),IIP(1010),I2(1010),I2P(1010)                 GRI02860
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    GRI02870
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               GRI02880
```

```
      COMMON/IN/AN2,BA2,XC,DIV,E,THETAE,R0                              GRID02890
      COMMON/GN/RR(1010),RF(1010),THETA0,TOTE,PSI,PSI0                  GRID02900
C                                                                       GRID02910
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                           GRID02920
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,CCUNT,COOR,COORT              GRID02930
      REAL N1,N2,N3                                                     GRID02940
      REAL II,IIP,I2,I2P                                                GRID02950
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRID02960
C                                                                       GRID02970
      III(J)=PI/2.0-ALPHA-U                                             GRID02980
      CALL INDEX(RF(J),RF(J),N2)                                        GRID02990
C     COMPUTES N2 AT RF(J)                                              GRID03000
      IIP(J)=ARSIN(N2/N2*SIN(III(J)))                                   GRID03010
      DELTA=TOTE-ALPHA                                                  GRID03020
      PSI=PI/2.0+IIP(J)-DELTA                                           GRID03030
      E=N2*RF(J)*SIN(PSI)                                               GRID03040
      RETURN                                                            GRID03050
      END                                                               GRID03060
                                                                        GRID03070
      SUBROUTINE REAR                                                   GRID03080
      COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            GRID03090
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        GRID03100
      COMMON/PT/SHAPE,SQURAY,ELLIPS,ICHECK                              GRID03110
      COMMON/SHP/III(1010),IIP(1010),I2(1010),I2P(1010)                 GRID03120
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    GRID03130
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               GRID03140
      COMMON/IN/AN2,BA2,XC,DIV,E,THETAE,R0                              GRID03150
      COMMON/GN/RR(1010),RF(1010),THETA0,TOTE,PSI,PSI0                  GRID03160
C                                                                       GRID03170
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                           GRID03180
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,CCUNT,COOR,COORT              GRID03190
      REAL N1,N2,N3                                                     GRID03200
      REAL II,IIP,I2,I2P                                                GRID03210
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRID03220
C                                                                       GRID03230
      PSI0=PI-PSI0                                                      GRID03240
      DELP=PI-THETA0-PSI0                                               GRID03250
      A=(N3/N2*COS(BETA(J))-COS(DELP))/(N3/N2*SIN(BETA(J))-SIN(DELP))   GRID03260
      X=SQRT(1.0/(1.0+A**2))                                            GRID03270
      ETA(J)=ARSIN(X)                                                   GRID03280
      I2(J)=DELP-ETA(J)                                                 GRID03290
      I2P(J)=BETA(J)-ETA(J)                                             GRID03300
      RETURN                                                            GRID03310
      END                                                               GRID03320
                                                                        GRID03330
      SUBROUTINE NOSE                                                   GRID03340
      COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            GRID03350
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        GRID03360
      COMMON/PT/SHAPE,SQURAY,ELLIPS,ICHECK                              GRID03370
      COMMON/IN/AN2,BA2,XC,DIV,E,THETAE,R0                              GRID03380
      COMMON/SHP/III(1010),IIP(1010),I2(1010),I2P(1010)                 GRID03390
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    GRID03400
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               GRID03410
      COMMON/SK/K,L,IZ,IZ1,M,N,NP1,FLAG(1010),IZ0,RAYS,IZ2,DRAYS        GRID03420
     1,NUMBR,COORD,NUME,IANGLE,THICK,IZ4,IZ5,CCUNT,IZ6                  GRID03430
     2,COOR(5CC),NUMPT,COORT,GAMMA,AE,ONP,STATAA                        GRID03440
     3,RAYY(1010),RAYZ(1010),CENI,TOPBI,BOTI,TOPI                       GRID03450
     4,RADIUS,CEN,TCE,PLT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         GRID03460
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRID03470
     6,NFI,NPJ,NPK,THETA,PHI,PHIP,A0,B0,C0,DC,E0,PAR1,PAR2              GRID03480
     7,PAR3,XC,YO,ZO,NUM,CKP,CLP,CNP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI    GRID03490
     8,NUM5,CKPP,CLPP,CNPP,D3,DPL(1010),DI,NUM6,NUM7,NTRCTY(1010)       GRID03500
     9,YIM(1010),ZIM(1010),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO        GRID03510
      COMMON/SM/NLMB,THETAI,XOIAPT(1010),YOIAPT(1010),SUM1              GRID03520
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           GRID03530
     2,ROC(300),SUM4(300),FRACTN(300),SQRAD(1010),YCENTR(20,500)        GRID03540
C                                                                       GRID03550
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                           GRID03560
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,CCUNT,COOR,COORT              GRID03570
      REAL N1,N2,N3                                                     GRID03580
      REAL II,IIP,I2,I2P                                                GRID03590
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRID03600
```

```
      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      GRI03610
     1,NTNCTY                                                           GRI03620
C                                                                       GRI03630
C    OPAQUE NOSE SECTION FOLLOWS                                        GRI03640
C                                                                       GRI03650
          GO TO (1,2),ICASE                                             GRI03660
    1     AB=(-X1(J-1))+(Y1(J-1))/DYDXT(J-1)                            GRI03670
          STATNA=-AB                                                    GRI03680
          GAMMA=ATAN(DYDXT(J-1))                                        GRI03690
          ONP=(Y1(J-1))/SIN(GAMMA)                                      GRI03700
          IF(SHAPE.EQ.1)WRITE(6,300)GAMMA,STATNA,ONP                    GRI03710
          GO TO 90                                                      GRI03720
    2     AB=+X2(K)                                                     GRI03730
          BF=BF-AB                                                      GRI03740
          XC=XC-AB                                                      GRI03750
          DO 10 J=1,K                                                   GRI03760
          X1(J)=X1(J)-AB                                                GRI03770
   10     X2(J)=X2(J)-AB                                                GRI03780
          WRITE(6,400)AB,X2(1),BF,XC                                    GRI03790
          GO TO 90                                                      GRI03800
  300 FORMAT('0',1X,'OPAQUE NOSE SECTION:'//1X,'NOSE HALF ANGLE = ',    GRI03810
     1F7.5,2X,'STATION A = ',F9.5,2X,'SURFACE LENGTH = ',F7.5////)      GRI03820
  400 FORMAT(2X,4F9.5)                                                  GRI03830
   90 RETURN                                                            GRI03840
      END                                                               GRI03850
                                                                        GRI03860
      SUBROUTINE ZOYO                                                   GRI03870
      COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            GRI03880
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        GRI03890
      COMMON/PT/SHAPE,SQURAY,ELLIPS,ICHECK                              GRI03900
       COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)                 GRI03910
     1,ETA(101C),X1(1010),Y1(1010),X2(1010),Y2(1010)                    GRI03920
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               GRI03930
       COMMON/SK/K,L,IZ,IZI,M,N,NP1,FLAG(101C),IZO,RAYS,IZ2,DRAYS       GRI03940
     1,NUMBR,COORD,NUMB,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                  GRI03950
     2,CCOP(500),NUMBT,COORT,GAMMA,AB,ONP,STATNA                        GRI03960
     3,RAYY(1010),RAYZ(1010),CENI,TORBI,BOTI,TOPI                       GRI03970
     4,RADIUS,CEN,TCF,FCT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         GRI03980
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                   GRI03990
     6,NPI,NPJ,NPK,THETA,PPI,PHIP,A0,B0,C0,CC,F0,PAR1,PAR2             GRI04000
     7,PAR3,XC,YO,ZC,NLP,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI   GRI04010
     8,NUM5,CKPP,CLPP,CMPP,D3,OPL(1010),DL,NUM6,NUM7,NTNCTY(1010)       GRI04020
     9,YIM(101C),ZIM(1010),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO        GRI04030
       COMMON/SM/NUME,THETAI,XDIAPT(1010),YDIAPT(1010),SUM1             GRI04040
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           GRI04050
     2,REC(300),SUM4(300),FRACTN(300),SORAD(1010),YCENTR(20,500)        GRI04060
C                                                                       GRI04070
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                           GRI04080
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOP,COOPT              GRI04090
      REAL N1,N2,N3                                                     GRI04100
      REAL I1,I1P,I2,I2P                                                GRI04110
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                   GRI04120
      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      GRI04130
     1,NTNCTY                                                           GRI04140
C                                                                       GRI04150
C    ALGORITHM TRACE RAY (SEE INPUTS:X1(J),Y1(J),DYDXN(J),X2(J))       GRI04160
      IF(ICHECK.EQ.20)GO TO 20                                          GRI04170
      IF(ICHECK.EQ.30)GO TO 30                                          GRI04180
      IZ=1                                                              GRI04190
      COUNT=0                                                           GRI04200
      RAYY(IZ)=0.0                                                      GRI04210
      RAYZ(IZ)=0.0                                                      GRI04220
      NTNCTY(IZ)=1.0                                                    GRI04230
      IF(SQURAY .EQ. 1) WRITE(6,400) ALFAP,GRID                         GRI04240
   20 ICHECK=0                                                          GRI04250
      IF(RAYZ(IZ) .GE. Y1(K)) GO TO 30                                  GRI04260
        CENI=(FP+X1(K))*SIN(ALFAP)                                      GRI04270
        TORBI=SQRT(Y1(K)**2-RAYZ(IZ)**2)                                GRI04280
        BOTI=CENI-TORBI                                                 GRI04290
        IF(RAYY(IZ) .LE. BOTI) GO TO 30                                 GRI04300
          TOPI=CENI+TORBI                                               GRI04310
          IF(RAYY(IZ) .GE. TOPI) GO TO 31                               GRI04320
```

```
            RAYZ(IZ)=RAYZ(IZ)+GRID                                      GRID4310
            GO TO 20                                                    GRID4320
   30 ICHECK=0                                                          GRID4330
C  SEARCH FOR Y1(J) JUST GT RAYZ(IZ); RETRIEVE X1(J)                    GRID4340
      N=K/2                                                             GRID4350
      IF(Y1(M) .LT. RAYZ(IZ)) GO TO 32                                  GRID4360
        IF(RAYY(IZ) .GT. 1.15) GO TO 32                                 GRID4370
          N=K-1                                                         GRID4380
   31 CONTINUE                                                          GRID4390
      IF(Y1(N) .GT. RAYZ(IZ)) GO TO 36                                  GRID4400
        N=N-1                                                           GRID4410
        IF(N .EQ. 0) GO TO 34                                           GRID4420
        GO TO 31                                                        GRID4430
   32 CONTINUE                                                          GRID4440
      N=M                                                               GRID4450
   33 CONTINUE                                                          GRID4460
      IF(Y1(N) .GT. RAYZ(IZ)) GO TO 36                                  GRID4470
        N=N-1                                                           GRID4480
        IF(N .EQ. 0) GO TO 34                                           GRID4490
        GO TO 33                                                        GRID4500
   34 CONTINUE                                                          GRID4510
      RAYZ(IZ)=0.0                                                      GRID4520
      IF(RAYY(IZ) .LT. 0.0) GO TO 35                                    GRID4530
        RAYY(IZ)=RAYY(IZ)+GRID                                          GRID4540
        GO TO 20                                                        GRID4550
   35 CONTINUE                                                          GRID4560
      RAYY(IZ)=RAYY(IZ)-GRID                                            GRID4570
      GO TO 20                                                          GRID4580
  400 FORMAT('1',' SKEW RAY TRACE PARAMETERS:'///5X,'ALFAP= ',F9.7,2X,  GRID4590
     1'GRID= ',F9.7,2X,'SEE CONS PARAMETERS ABOVE.'///2X,'RAY',2X,      GRID4600
     2'RAYY',4X,'RAYZ',4X,'XO',6X,'YO',6X,'XI',6X,'YI',6X,'ZI',6X,      GRID4610
     3'GPL',5X,'YIM',5X,'ZIM',5X,'INTNCTY',2X,'XDIAPT',4X,'YDIAPT'      GRID4620
     4/7X,'PHII',4X,'PHIIP',3X,'CKPP',4X,'CLPP',4X,'CMPP',4X,           GRID4630
     5'D3',6X,'D1',6X,'NUM6',4X,'NUM7',4X,'NUM8'/)                      GRID4640
   36 RETURN                                                            GRID4650
      END                                                               GRID4660
                                                                        GRID4670
      SUBROUTINE RADI                                                   GRID4680
      COMMON/ET/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),BF            GRID4690
     1,ALFAP,GRID,ELLNUP,ENUM,ELLBF,PI,RAD,IPASE                        GRID4700
      COMMON/PT/SHAPE,SQURAY,ELLIPS,ICHECK                              GRID4710
      COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)                  GRID4720
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    GRID4730
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               GRID4740
      COMMON/SK/K,L,IZ,IZI,M,N,NP1,FLAG(1010),IZO,RAYS,IZ2,DRAYS        GRID4750
     1,NUMOR,COORD,NUMP,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                  GRID4760
     2,COOR(500),NUMBT,COORT,GAMMA,AB,OMP,STAINA                        GRID4770
     3,RAYY(1010),RAYZ(1010),CENI,TORBI,BOTI,TOPI                       GRID4780
     4,RADIUS,CEN,TOP,BOT,TORR,DELTAX,DELTAY,SP,STRATIO,DYDXNP          GRID4790
     5,AX,AY,AZ,RX,RY,RZ,AXI,AYI,AZI,PHII,PHIIP,TIRA                    GRID4800
     6,API,NPJ,APK,THETA,PHI,PHIP,AO,BO,CO,DO,EO,PAR1,PAR2              GRID4810
     7,PAR3,XC,YC,ZC,NUM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI    GRID4820
     8,NUM5,CKPP,CLPP,CMPP,D3,OPL(1010),DL,NUM6,NUM7,NTNCTY(1010)       GRID4830
     9,YIM(1010),ZIM(1010),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO        GRID4840
      COMMON/SM/NUMB,THETAI,XDIAPT(1010),YDIAPT(1010),SUM1              GRID4850
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           GRID4860
     2,RCC(1010),SUM4(300),FRACTN(300),SUMAD(1010),YCENTR(20,501)       GRID4870
C                                                                       GRID4880
      INTEGER ELLNUP,ENUM,SHAPE,SQURAY,ELLIPS                           GRID4890
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT              GRID4900
      REAL N1,N2,N3                                                     GRID4910
      REAL I1,I1P,I2,I2P                                                GRID4920
     1,AX,AY,AZ,RX,RY,RZ,AXI,AYI,AZI,PHII,PHIIP,TIRA                    GRID4930
      REAL NPI,APJ,APK,AUP,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      GRID4940
     1,NTNCTY                                                           GRID4950
C                                                                       GRID4960
   36    GO TO (361,362),ICASE                                          GRID4970
  361    YRN=Y1(K)                                                      GRID4980
         YR1=Y1(1)                                                      GRID4990
      RADIUS=SQRT(RAYZ(IZ)**2+((RAYY(IZ)/COS(ALFAP))-(X1(N)+AB)*        GRID5000
     1TAN(ALFAP))**2)                                                   GRID5010
         GO TO 363                                                      GRID5020
                                                                        GRID5030
                                                                        GRID5040
```

```
  362     YRN=Y2(N)                                                      GRID5050
          YR1=Y2(1)                                                      GRID5060
C     RADIUS IS DEFINED IN SKEWT                                         GRID5070
  363 IF(YRN .GT. RADIUS) GO TO 40                                       GRID5080
        IF(RADIUS .GT.YR1) GO TO 37                                      GRID5090
        N=N-1                                                            GRID5100
        GO TO 36                                                         GRID5110
   37 CONTINUE                                                           GRID5120
      N=N-1                                                              GRID5130
      IF(N .GT. 0) GO TO 36                                              GRID5140
      CEN=(X1(1)+AB)*SIN(ALFAP)                                          GRID5150
      TORB=Y1(1)*COS(ALFAP)                                              GRID5160
      RAYZ(IZ)=0.0                                                       GRID5170
      IF(RAYY(IZ) .GE. 0.0) GO TO 38                                     GRID5180
        RAYY(IZ)=RAYY(IZ)-GRID                                           GRID5190
        BOT=CEN-TORB                                                     GRID5200
C       CHECK FOR BOTTOM EDGE OF LENS, GO TO MIRROR IMAGE RAYS           GRID5210
        IF(RAYY(IZ) .LT. BOT) ICHECK=60                                  GRID5220
        IF(RAYY(IZ) .GE. BOT) ICHECK=20                                  GRID5230
        RETURN                                                           GRID5240
   38 CONTINUE                                                           GRID5250
      RAYY(IZ)=RAYY(IZ)+GRID                                             GRID5260
      TOP=CEN+TORB                                                       GRID5270
      IF(RAYY(IZ) .GT. TOP) GO TO 39                                     GRID5280
        ICHECK=20                                                        GRID5290
        RETURN                                                           GRID5300
   39 CONTINUE                                                           GRID5310
      RAYY(IZ)=-GRID                                                     GRID5320
      ICHECK=20                                                          GRID5330
      RETURN                                                             GRID5340
   40 ICHECK=40                                                          GRID5350
      RETURN                                                             GRID5360
      END                                                                GRID5370
                                                                         GRID5380
      SUBROUTINE SKEWC                                                   GRID5390
C     WILL BE ADDED IN CAPT. CARR'S THESIS                               GRID5400
      STOP                                                               GRID5410
      END                                                                GRID5420
                                                                         GRID5430
      SUBROUTINE SKEWT                                                   GRID5440
       COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),RF            GRID5450
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                         GRID5460
       COMMON/PT/SHAPE,SQUFAY,ELLIPS,ICHECK                              GRID5470
        COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)                 GRID5480
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                     GRID5490
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                                GRID5500
        COMMON/IN/AN2,BN2,XC,DIV,E,THETAF,R0                             GRID5510
        COMMON/GR/RR(1010),RF(1010),THETA0,TOTF,PSI,PSI0                 GRID5520
        COMMON/DET/A1,A2,A3,B1,B2,B3,C1,C2,C3                            GRID5530
        COMMON/DIR/RRX,RRY,RRZ,NPFX,NPFY,NPFZ,PSIR                       GRID5540
        COMMON/EN2/RRF,RFI                                               GRID5550
        COMMON/IT/ILCOP                                                  GRID5560
       COMMON/SK/K,L,IZ,IZI,M,N,NP1,FLAG(1010),IZ0,RAYS,IZ2,DRAYS        GRID5570
     1,NUMBR,CCORD,NUME,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                   GRID5580
     2,CCOR(500),NUMBT,COORT,GAMMA,AB,ONP,STATNA                         GRID5590
     3,RAYY(1010),RAYZ(1010),CENI,TORBI,BOTI,TOPI                        GRID5600
     4,RADIUS,CEN,TOP,BOT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP          GRID5610
     5,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                     GRID5620
     6,NFI,NPJ,NPK,THETA,PFI,PHIP,A0,B0,C0,D0,E0,PAR1,PAR2               GRID5630
     7,PAR3,XC,YO,ZC,NUM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI     GRID5640
     8,NUM5,CKPP,CLPP,CMPP,D3,GPL(1010),DI,NUM6,NUM7,NTINCTY(1010)       GRID5650
     9,YIM(1010),ZIM(1010),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO         GRID5660
        COMMON/SM/NUMB,THETAI,XOIAPT(1010),YOIAPT(1010),SUM1             GRID5670
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)            GRID5680
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1010),YCENTR(20,500)         GRID5690
C                                                                        GRID5700
       INTEGER ELLNUM,ENUM,SHAPE,SQUFAY,ELLIPS                           GRID5710
       INTEGER FLAG,RAYS,DRAYS,CCORD,THICK,COUNT,COOR,COORT              GRID5720
       REAL I1,N2,N3                                                     GRID5730
       REAL I1,I1P,I2,I2P                                                GRID5740
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                     GRID5750
       REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      GRID5760
```

```
      1,NTHCTY
      REAL NPF,NPFX,NPFY,NPFZ,NPFM,NPFMX,NPFMY,NPFMZ
C
         AS=TAN(ALPHA)
         CS=RAYY(IZ)/COS(ALFAP)
         DS=TAN(ALFAP)
         A2D2=AS**2-DS**2
         CDS=CS*DS+(AB)*A2D2
         C7D=CS**2+RAYZ(IZ)**2-((AB)**2)*A2D2-2.0*CS*DS*(AB)
      XC=1.0/A2D2*(-CDS+SQRT(CDS**2+A2D2*(C7D)))
      YC=CS-(XC+AB)*DS
      ZC=RAYZ(IZ)
         NX=-SIN(ALPHA)
         IF(YC .EQ. 0.0) GO TO 41
         ZOYC=(ZC/YC)
         IF(ZOYC .GE. 8235000) GO TO 41
         IF(ZOYC .LE. -8235000) GO TO 42
         SIG=ATAN(ZOYC)
C     DIRECTION COSINES OF OUTSIDE SURFACE NORMAL
         NY=COS(SIG)*COS(ALPHA)
         NZ=SIN(SIG)*COS(ALPHA)
         GO TO 43
   41       NY=0.0
            NZ=1.0*COS(ALPHA)
            GO TO 43
   42       NY=0.0
            NZ=-1.0*COS(ALPHA)
   43    CONTINUE
            IF(RAYY(IZ).GE.0.0)GO TO 45
            NY=-NY
            NZ=-NZ
   45  CONTINUE
C     DIRECTION COSINES OF RAY
         RX=COS(ALFAP)
         RY=-SIN(ALFAP)
         RZ=0.0
C     FRONT RADIUS
         RF1=SQRT((XC-XC)**2+YC**2+ZC**2)
         CALL INDEX(RF1,RF1,N2)
C     ANGLES OF INCIDENCE AND REFRACTION OUTSIDE SURFACE
         THETA=ARCOS(NX*RX+NY*RY)
         PHI=PI-THETA
         PHIP=ARSIN((N1/N2)*SIN(PHI))
C
C     DIRECTION COSINES OF INTERNAL REFRACTED RAY
         NUM=COS(PHIP)-N1/N2*COS(PHI)
         CKPF=N1/N2*RX-NUM*NX
         CLPF=N1/N2*RY-NUM*NY
         CMPF=-NUM*NZ
         CKP=CKPF
         CLP=CLPF
         CMP=CMPF
C     FRONT RADIUS DIRECTION OF COSINES
         RFX=(XC-XC)/RF1
         RFY=YC/RF1
         RFZ=ZC/RF1
         TOTE=ARCOS(RFX)
C     ANGLE PSI AND CONSTANT E AT FRONT SURFACE
         PSIF=ARCOS(RFX*CKP+RFY*CLP+RFZ*CMP)
         E=N2*RF1*SIN(PSIF)
C     ASSUME THETAE AND COMPUTE REAR RADIUS FROM FORMULA
         THETAE=TOTE
C     START ITTERATION TO FIND THETAE
         ILOOP=1
         EPS=1.0E-05
  401    CALL FADN2(RRF,RF1,-1.0)
         IF(RRF.GT.0.0)GO TO 402
         THETAC=TOTE
         THETAE=0.0
         GO TO 405
  402    THETA0=TOTE-THETAE
         RRX=COS(THETA0)
```

```
      RADIUS=RRF*SIN(THETA0)                                          GRI06490
C     ITERATION TO FIND CORRECT PLACE                                 GRI06500
      CALL RADI                                                       GRI06510
      IF(IC+ECK.NE.40)RETURN                                          GRI06520
   40 NP1=N+1                                                         GRI06530
C     INTERNAL RAY LENGTH AND INSIDE SURFACE INTERCEPT                GRI06540
      AR=(Y2(N)-Y2(NP1))/(X2(N)-X2(NP1))                              GRI06550
      BR=(Y2(N)*X2(NP1)-Y2(NP1)*X2(N))/(X2(N)-X2(NP1))                GRI06560
C     COMPUTE X-COORDINATE OF REAR SURFACE(XI)                        GRI06570
      XI=RRF*COS(THETA0)+XC                                           GRI06580
  403 AP=RRF**2*(1.0+AR**2)                                           GRI06590
      BP=RRF*(BR-XC*AR)                                               GRI06600
      CP=(BR-XC*AR)**2-(AR*RRF)**2                                    GRI06610
      DEC=BP**2-AP*CP                                                 GRI06620
      IF(DEC.LT.0.0)DEC=0.0                                           GRI06630
      XNEW=-BP/AP+SQRT(DEC)/AP                                        GRI06640
      IF(XNEW.LT.0.0)XNEW=ABS(XNEW)                                   GRI06650
      IF(XNEW.GT.1.0)XNEW=1.0                                         GRI06660
      THETA1=THETA0                                                   GRI06670
      THETAC=ARSIN(XNEW)                                              GRI06680
      THETAC=(THETA0+THETA1)/2.0                                      GRI06690
      THETAE=TOTE-THETA0                                              GRI06700
      IF(THETAE.LT.0.0)THETAE=TOTE                                    GRI06710
      DIFF=ABS(THETA0-THETA1)                                         GRI06720
  404 IF(DIFF.LE.EPS)GO TO 410                                        GRI06730
  405 IF(ILOOP.GT.100)GO TO 490                                       GRI06740
      ILOOP=ILOOP+1                                                   GRI06750
      GO TO 401                                                       GRI06760
C     END OF LOOP ROUTINE TO FIND THETAE                              GRI06770
  410   IF(XI .LT. (-1.0E-03))GO TO 51                                GRI06780
        IF(XI.LT.0.0)XI=0.0                                           GRI06790
        IF((XI-X2(1)).GT.(1.0E-03))GO TO 51                           GRI06800
        IF((XI-X2(1)).GT.0.0)XI=X2(1)                                 GRI06810
        IF(DEC.GT.0.0)GO TO 411                                       GRI06820
        DEC=BP**2-AP*CP                                               GRI06830
        IF(DEC.GE.(1.0E-03))GO TO 411                                 GRI06840
        GO TO 51                                                      GRI06850
  411   AP=(RRF*COS(THETAF)-(XI-XC)*RFX)                              GRI06860
        IF((ABS(RFZ)).GT.(1.0E-05))GO TO 412                          GRI06870
        YI=AP/RFY                                                     GRI06880
        GO TO 415                                                     GRI06890
  412   AP=AP/RFZ                                                     GRI06900
        BP=RFY/RFZ                                                    GRI06910
        APP=1.0+BP**2                                                 GRI06920
        BPP=AP*BP                                                     GRI06930
        CPP=AP**2-(RRF*SIN(THETA0))**2                                GRI06940
        DEC=BPP**2-APP*CPP                                            GRI06950
        IF(DEC.LT.(-5.0E-04))GO TO 50                                 GRI06960
        IF(DEC.LT.0.0)DEC=0.0                                         GRI06970
        YI=BPP/APP+SQRT(DEC)/APP                                      GRI06980
  415   DEC=((RRF*SIN(THETA0))**2-YI**2)                              GRI06990
        IF(DEC.LT.(-5.0E-04))GO TO 492                                GRI07000
        IF(DEC.LT.0.0)DEC=0.0                                         GRI07010
        ZI=SQRT(DEC)                                                  GRI07020
C     DIRECTION COSINES OF INSIDE NORMAL                              GRI07030
      ARFUN=SQRT(1.0+AR**2)                                           GRI07040
      YZFUN=SQRT(YI**2+ZI**2)                                         GRI07050
      NXI=-AR/ARFUN                                                   GRI07060
      NYI=+YI/(YZFUN*ARFUN)                                           GRI07070
      NZI=+ZI/(YZFUN*ARFUN)                                           GRI07080
C     NORMAL TO PLANE OF THE CURVED RAY, AT XO,YO,ZO                  GRI07090
  420 NPFX=RFY*CMP-RFZ*CLP                                            GRI07100
      NPFY=RFZ*CKF-RFX*CMP                                            GRI07110
      NPFZ=RFX*CLP-RFY*CKP                                            GRI07120
      NPF=SQRT(NPFX**2+NPFY**2+NPFZ**2)                               GRI07130
      NPFX=NPFX/NPF                                                   GRI07140
      NPFY=NPFY/NPF                                                   GRI07150
      NPFZ=NPFZ/NPF                                                   GRI07160
C     DIRECTION COSINES OF REAR RADIUS AT XI,YI,ZI                    GRI07170
      RRX=(XI-XC)/RRF                                                 GRI07180
      RRY=YI/RRF                                                      GRI07190
      RRZ=ZI/RRF                                                      GRI07200
```

```
      IF(SQURAY.NE.2)GO TO 89                                          GRIN7310
      WRITE(6,87)IZ,XC,YC,ZC,NX,NY,NZ,RX,RY,RZ,PHI,PHIP,NUM           GRIN7320
     1,CKP,CLP,CMP,RFX,RFY,RFZ,NPFX,NPFY,NPFZ,PSIF,E                  GRIN7330
     2,XC,THETAO,THETAE,DIFF,RADIUS,DIFF,ICOMP                        GRIN7340
     3,AR,PF,XI,YI,ZI,PFX,PFY,PFZ,RRF                                GRIN7350
  85 CONTINUE                                                         GRIN7360
         CALL INDEX(PRF,PFI,NC)                                       GRIN7370
         PSIR=ARSIN(E/(N2*RFI))                                       GRIN7380
C      DIRECTION COSINES OF RAY AT XI,YI,ZI                          GRIN7390
         CALL DIRECT(CKF,CLP,CMP)                                     GRIN7400
      CCTF=NXI*CKP+NYI*CLP+NZI*CMP                                    GRIN7410
      IF(CCTF.GT.1.0)CCTF=1.0                                         GRIN7420
      IF(CCTF.LT.(-1.0))CCTF=-1.0                                     GRIN7430
      IF(SQURAY.NE.2)GO TO 99                                         GRIN7440
      WRITE(6,97)YI,ZI,ARFUN,YZFUN,NXI,NYI,NZI,CCTF,PSIR,CKP,CLP,CMP  GRIN7450
  99 CONTINUE                                                         GRIN7460
C      CALCULATE APPROXIMATE OPTICAL PATH LENGTH INSIDE LENS         GRIN7470
      D2=(RFI+RPFI)/2.0*THETAE                                        GRIN7480
C       ANGLES OF INCIDENCE OF INSIDE SURFACE                        GRIN7490
         THETAI=ARCOS(CCTF)                                           GRIN7500
         PHII=PI-THETAI                                               GRIN7510
C       CHECK FOR TOTAL INTERNAL REFLECTION:                          GRIN7520
         TIRA=ARSIN(N3/N2)                                            GRIN7530
         IF(PHII.GE.TIRA) GO TO 52                                    GRIN7540
         PHIIP=ARSIN(N2/N3*SIN(PHII))                                 GRIN7550
      RETURN                                                          GRIN7560
  50     ICHECK=50                                                    GRIN7570
         IF(SQURAY.GE.2)WRITE(6,59)IZ,RADIUS,DIFF,THETAE,THETAO,XI    GRIN7580
     1                  ,XC,RRF,RFX,RFY,RFZ,AP,BP,APP,BPP,CPP,DFC,XO,YO,ZC GRIN7590
  59     FORMAT(1X,I4,1(F8.3/4X,5F8.3,F11.3,3F8.3/)                   GRIN7600
         RETURN                                                       GRIN7610
  51     ICHECK=51                                                    GRIN7620
         IF(SQURAY.GE.2)WRITE(6,59)IZ,RADIUS,DIFF,THETAE,THETAO,XI    GRIN7630
     1                  ,XC,RRF,RFX,RFY,RFZ,AP,BP,APP,BPP,CPP,DFC,XO,YO,ZC GRIN7640
         RETURN                                                       GRIN7650
  52     ICHECK=52                                                    GRIN7660
  87 FORMAT(1X,I4,12F8.3/4X,12F8.3/4X,5F9.3,E10.2,I4/4X,9F8.3/)       GRIN7670
  97 FORMAT(4X,8F8.3/4X,4F8.3/)                                       GRIN7680
         RETURN                                                       GRIN7690
 490 IF(SQURAY.GE.2)WRITE(6,497)RADIUS,THETAO,THETAE,DIFF,IZ          GRIN7700
 497 FORMAT(2X,'DO NOT FIND SOLUTION IN SKEW'/2X,4E12.4,2X,I4)        GRIN7710
      GO TO 50                                                        GRIN7720
 492 IF(SQURAY.GE.2)WRITE(6,498)IZ,YI                                 GRIN7730
 498 FORMAT(2X,'NEGETIVE DEC. IN ZI',2X,I4,2X,F10.3)                  GRIN7740
      GO TO 50                                                        GRIN7750
      END                                                             GRIN7760
                                                                      GRIN7770
       SUBROUTINE INTERS                                              GRIN7780
       COMMON/CT/E,ALPHA,U,I,P,T(1010),N1,N2,N3,BETA(1010),RF         GRIN7790
     1,ALFAP,CFID,ELLNUM,ENUM,ELLRF,PI,RAD,ICASE                      GRIN7800
       COMMON/FT/SHAPE,SQURAY,ELLIPS,ICHECK                           GRIN7810
       COMMON/SHP/III(1010),IIP(1010),I2(1010),I2P(1010)              GRIN7820
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                  GRIN7830
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                             GRIN7840
       COMMON/FN2/PRF,PFI                                             GRIN7850
       COMMON/SK/K,L,IZ,IZI,M,N,NP1,FLAG(1010),IZ0,RAYS,IZ2,DRAYS     GRIN7860
     1,NUMR,CCCPO,NUMR,IANGLE,THICK,IZ4,IZ5,CCUNT,IZ6                 GRIN7870
     2,CCCP(500),NUMBT,COORT,GAMMA,AP,DMP,STATNA                      GRIN7880
     3,RAYY(1010),RAYZ(1010),CENI,TURBI,DOTI,TUPI                     GRIN7890
     4,RADIUS,CEN,TCP,RCT,TURB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP       GRIN7900
     5,RX,RY,N2,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                  GRIN7910
     6,RFI,NPJ,NPK,THETA,PHI,PHIP,AO,BO,CO,EO,FO,PAR1,PAR2            GRIN7920
     7,PAR3,XC,YO,ZC,NUM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI  GRIN7930
     8,NUMF,CKFP,CLPF,CMPP,D3,UPL(1010),DI,NUM6,NUM7,NINCTY(1010)     GRIN7940
     9,YIM(1010),ZIM(1010),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO      GRIN7950
       COMMON/SM/NUM8,THETAI,XOIAPT(1010),YOIAPT(1010),SUM1           GRIN7960
     1,SUM2,SUP3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)         GRIN7970
     2,RCC(300),SUM4(300),FRACTN(300),SURAD(1010),YCENTR(20,500)      GRIN7980
C                                                                     GRIN7990
       INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                        GRIN8000
       INTEGER FLAG,RAYS,DRAYS,COORD,THICK,CCUNT,COOR,COORT           GRIN8010
       REAL N1,N2,N3                                                  GRIN8020
```

```
      REAL II,JIP,I2,I2P                                                GRI07930
     1,NX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                   GRI07940
      REAL NPI,NFJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8     GRI07950
     1,NTACTY                                                           GRI07960
C                                                                       GRI07970
          IF(ICHECK.EQ.50)GO TO 50                                      GRI07980
          IF(ICHECK.EQ.51)GO TO 51                                      GRI07990
          IF(ICHECK.EQ.52)GO TO 52                                      GRI08000
C INSERT CALCULATION OF TRANSMITTED INTENSITY                           GRI08010
C                                                                       GRI08020
          NUM8=COS(PHIIP)-(N2/N3)*COS(PHII)                             GRI08030
C         DIRECTION COSINES OF INSIDE EXTERNAL REFRACTED RAY            GRI08040
          CKPP=(N2/N3)*CKP-NUM8*NXI                                     GRI08050
          CLPP=(N2/N3)*CLP-NUM8*NYI                                     GRI08060
          CMPP=(N2/N3)*CMP-NUM8*NZI                                     GRI08070
C         LENGTH OF INSIDE EXTERNAL REFRACTED RAY                       GRI08080
          D3=(BF-XI)/CKPP                                               GRI08090
          NUM6=((XC+AB)*RX+YO*RY)                                       GRI08100
          NUM7=((XC+AB)*(-RY)+YO*RX)                                    GRI08110
C         LENGTH OF OUTSIDE INCIDENT RAY                                GRI08120
          D1=SQRT((XC-NUM6)**2+(YO-NUM7)**2)                            GRI08130
C         TOTAL OPTICAL PATHLENGTH:                                     GRI08140
          RAVE=(RF1+RRF)/2.0                                            GRI08150
          CALL INDEX(RAVE,RF1,N2)                                       GRI08160
          OPL(IZ)=N1*D1+N2*D2+N3*D3                                     GRI08170
C         INTERSECTION WITH THE IMAGE PLANE:                            GRI08180
          YIM(IZ)=((BF-XI)/CKPP)*CLPP+YI                                GRI08190
          ZIM(IZ)=((BF-XI)/CKPP)*CMPP+ZI                                GRI08200
      IF(SQURAY.NE.2)GO TO 99                                           GRI08210
      WRITE(6,97)IZ,CKP,CLP,CMP,NXI,NYI,NZI,NUM8,CKPP,CLPP,CMPP        GRI08220
     1           ,XI,YI,ZI,XC,YO,RX,RY,BF,NUM6,NUM7                    GRI08230
     2           ,D1,D2,D3,YIM(IZ),ZIM(IZ),PHII,PHIIP                  GRI08240
   99 CONTINUE                                                          GRI08250
          IF(CMPP .LT. 0.000000000001 .AND. CMPP .GT. -0.000000000001)GRI08260
     1      GO TO 46                                                   GRI08270
            XDIAPT(IZ)=(-ZIM(IZ)/CMPP)*CKPP+AB                          GRI08280
            YDIAPT(IZ)=(-ZIM(IZ)/CMPP)*CLPP+YIM(IZ)                     GRI08290
            GO TO 47                                                    GRI08300
   46 CONTINUE                                                          GRI08310
          XDIAPT(IZ)=99999.                                             GRI08320
          YDIAPT(IZ)=99999.                                             GRI08330
   47 CONTINUE                                                          GRI08340
          IF(SQURAY .EQ. 1) WRITE(6,500)IZ,RAYY(IZ),RAYZ(IZ),XO,YO,    GRI08350
     1    XI,YI,ZI,OPL(IZ),YIM(IZ),ZIM(IZ),NTACTY(IZ),XDIAPT(IZ),      GRI08360
     2    YDIAPT(IZ)                                                    GRI08370
     3   ,PHII,PHIIP,CKPP,CLPP,CMPP,D3,D1,NUM6,NUM7,NUM8               GRI08380
  471      FLAG(IZ)=0                                                  GRI08390
   49 CONTINUE                                                          GRI08400
      IZ1=IZ                                                            GRI08410
      IZ=IZ1+1                                                          GRI08420
      NTACTY(IZ)=1.0                                                    GRI08430
      RAYY(IZ)=RAYY(IZ1)                                                GRI08440
      RAYZ(IZ)=RAYZ(IZ1)+GRID                                           GRI08450
      IF(FLAG(IZ1) .EQ. 0) COUNT=COUNT+1                                GRI08460
      ICHECK=30                                                         GRI08470
      RETURN                                                            GRI08480
C     END OF RAY TRACE                                                  GRI08490
   50 ICHECK=0                                                          GRI08500
      NTACTY(IZ)=0.0                                                    GRI08510
      FLAG(IZ)=1                                                        GRI08520
      IF(SQURAY .EQ. 1) WRITE(6,600)IZ,RAYY(IZ),RAYZ(IZ),PHI,PHIP      GRI08530
      GO TO 49                                                          GRI08540
   51 ICHECK=1                                                          GRI08550
      NTACTY(IZ)=0.0                                                    GRI08560
      FLAG(IZ)=2                                                        GRI08570
      IF(SQURAY .EQ. 1) WRITE(6,700)IZ,RAYY(IZ),RAYZ(IZ),XI             GRI08580
      GO TO 49                                                          GRI08590
   52 ICHECK=2                                                          GRI08600
      NTACTY(IZ)=0.0                                                    GRI08610
      FLAG(IZ)=3                                                        GRI08620
      IF(SQURAY .EQ. 1) WRITE(6,800)IZ,RAYY(IZ),RAYZ(IZ),PHII,TIRA      GRI08630
      GO TO 49                                                          GRI08640
```

```
 97 FORMAT(1X,14,1PE9.5/3X,1PE9.5/3X,7E9.5/)                                    GRI08650
500 FORMAT(1X,14,11PE9.5,1X,2E10.3/4X,10E9.4/)                                  GRI08660
600 FORMAT(1X,14,2F10.7,' NO INTERCEPT WITH 2ND SURFACE; PHI= ',F10.7,GRI08670
   1,' PHIP= ',F10.7/)                                                          GRI08680
700 FORMAT(1X,14,2F10.7,' INTERCEPT OUTSIDE BOUNDARY OF 2ND SURFACE; YGRI08690
   11 =',F10.7/)                                                                GRI08700
800 FORMAT(1X,14,2F10.7,2X,'TOTAL INTERNAL REFLECTION AT 2ND SURFACE; GRI08710
   1PHII= ',F10.7,' ,PHIP= ',F10.7/)                                            GRI08720
    END                                                                         GRI08730
                                                                                GRI08740
    SUBROUTINE IMAGE                                                            GRI08750
     COMMON/CT/F,ALPHA,U,I,S,T(1010),N1,N2,N3,BETA(1010),BF                     GRI08760
    1,ALFAP,GFIC,ELLNUM,ENUM,ELLOF,PI,RAD,ICASE                                 GRI08770
     COMMON/P1/SHAPE,SQURAY,ELLIPS,ICHECK                                       GRI08780
     COMMON/SHP/I(1010),IIP(1010),I2(1010),I2P(1010)                            GRI08790
    1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                             GRI08800
    2,J,UP(1010),DYCX1(1010),DYDXA(1010)                                        GRI08810
     COMMON/SWK/K,L,IZ,IZ1,M,N,NP1,FLAG(1010),IZO,RAYS,IZ2,DRAYS                GRI08820
    1,ALMBR,CCCPD,NUMP,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                           GRI08830
    2,CCOR(500),NUMPT,COORT,GAMMA,AP,ONP,STETNA                                 GRI08840
    3,RAYY(1010),RAYZ(1010),CENI,TOPBI,BOTI,TOPI                                GRI08850
    4,RADIUS,CEN,TEF,BCT,TORR,DELTAX,DELTAY,SP,ST,RATIO,DYCXNP                  GRI08860
    5,AX,AY,AZ,PX,PY,PZ,RXI,RYI,RZI,PHII,PHIIP,TIRA                            GRI08870
    6,AFI,NPJ,NPK,THETA,PHI,PHIP,AO,BO,CO,DC,EC,PAP1,PAP2                      GRI08880
    7,PAR3,XC,YC,ZO,NUM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,C2,XI,YI,ZI            GRI08890
    8,NUM5,CKPP,CLPP,CMPP,D3,CPL(1010),DI,NUM6,NUM7,NTNCTY(1010)               GRI08900
    9,YIP(1010),ZIP(1010),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO                 GRI08910
     COMMON/SM/NUME,THETAI,XDIAPT(1010),YDIAPT(1010),SUM1                       GRI08920
    1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)                    GRI08930
    2,RCC(30C),SUM4(30C),FRACTN(30C),SURAD(1010),YCENTR(20,500)                 GRI08940
C                                                                               GRI08950
    INTEGER ELLNUM,EAUM,SHAPE,SQUAY,ELLIPS                                      GRI08960
    INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT                        GRI08970
    REAL N1,N2,N3                                                               GRI08980
    REAL I1,IIP,I2,I2P                                                          GRI08990
   1,NP,NY,NZ,RX,RY,RZ,RXI,NYI,NZI,PHII,PHIIP,TIRA                              GRI09000
    REAL NP1,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8                GRI09010
   1,NTNCTY                                                                     GRI09020
C                                                                               GRI09030
C    MIRROR IMAGE RAY MATCHING FOLLOWS                                          GRI09040
C                                                                               GRI09050
   60 CONTINUE                                                                  GRI09060
    IF(SQURAY .EQ. 1) WRITE(6,401)                                              GRI09070
    IZC=IZ-1                                                                    GRI09080
    IZ2=IZ-IZO                                                                  GRI09090
   61 CONTINUE                                                                  GRI09100
    IF(RAYZ(IZ2) .EQ. 0.0) IZ2=IZ2+1                                            GRI09110
      IF(IZ2 .GT. IZ3) GO TO 70                                                 GRI09120
        FLAG(IZ)=FLAG(IZ2)                                                      GRI09130
        IF(FLAG(IZ) .EQ. 0) COUNT=COUNT+1                                       GRI09140
        RAYY(IZ)=RAYY(IZ2)                                                      GRI09150
        RAYZ(IZ)=-RAYZ(IZ2)                                                     GRI09160
        IF(FLAG(IZ2) .GE. 1) GO TO 63                                           GRI09170
          XDIAPT(IZ)=XDIAPT(IZ2)                                                GRI09180
          YDIAPT(IZ)=YDIAPT(IZ2)                                                GRI09190
          YIP(IZ)=YIP(IZ2)                                                      GRI09200
          ZIP(IZ)=-ZIP(IZ2)                                                     GRI09210
          CPL(IZ)=CPL(IZ2)                                                      GRI09220
          NTNCTY(IZ)=NTNCTY(IZ2)                                                GRI09230
          IF(SQURAY .EQ. 1) WRITE(6,501) IZ,IZ2,RAYY(IZ),RAYZ(IZ),              GRI09240
   1      CPL(IZ),YIP(IZ),ZIP(IZ),NTNCTY(IZ),XDIAPT(IZ),YDIAPT(IZ)             GRI09250
   62 CONTINUE                                                                  GRI09260
    IZ2=IZ2+1                                                                   GRI09270
    IZ=IZ+1                                                                     GRI09280
    GO TO 61                                                                    GRI09290
   63 CONTINUE                                                                  GRI09300
    IF(FLAG(IZ2) .GE. 2) GO TO 64                                               GRI09310
      IF(SQURAY .EQ. 1) WRITE(6,601)IZ,IZ2,RAYY(IZ),RAYZ(IZ)                    GRI09320
      GO TO 62                                                                  GRI09330
   64 CONTINUE                                                                  GRI09340
    IF(FLAG(IZ2) .EQ. 3) GO TO 65                                               GRI09350
      IF(SQURAY .EQ. 1) WRITE(6,701)IZ,IZ2,RAYY(IZ),RAYZ(IZ)                    GRI09360
```

```
      GO TO 62                                                          GRI09370
   65 CONTINUE                                                          GRI09380
      IF(SQURAY .EQ. 1) WRITE(6,801)IZ,IZ2,RAYY(IZ),RAYZ(IZ)            GRI09390
      GO TO 62                                                          GRI09400
   70 CONTINUE                                                          GRI09410
      RAYS=IZ-1                                                         GRI09420
      DRAYS=RAYS-IZO                                                    GRI09430
      IF(SQURAY .EQ. 1) WRITE(6,900)RAYS,DRAYS,COUNT                    GRI09440
C                                                                       GRI09450
C     GENERATE OBJECT PLANE ELLIPSES:                                   GRI09460
C                                                                       GRI09470
      IF(ELLIPS .EQ. 1) WRITE(6,1000)ENUM                               GRI09480
      NUMBR=1                                                           GRI09490
      NUMB=1                                                            GRI09500
   71 CONTINUE                                                          GRI09510
      CCORD=1                                                           GRI09520
      ELZ(NUMB,COORD)=-Y1(NUMBR)                                        GRI09530
   72 CONTINUE                                                          GRI09540
      ELY(NUMB,COORD)=(X1(NUMBR)+AB)*SIN(ALFAP)+SQRT((Y1(NUMBR))**2-    GRI09550
     1(ELZ(NUMB,COORD))**2)*COS(ALFAP)                                  GRI09560
      ELZZ=ELZ(NUMB,CCORD)                                              GRI09570
      IF(ELLIPS .EQ. 1) WRITE(6,1100)NUMBR,CCORD,ELY(NUMB,CCORD),       GRI09580
     1ELZ(NUMB,CCORD)                                                   GRI09590
      CCORD=CCORD+1                                                     GRI09600
      ELZ(NUMB,COORD)=ELZZ+ELL                                          GRI09610
      IF(ELZ(NUMB,COORD) .GE. Y1(NUMBR)) GO TO 73                       GRI09620
        GO TO 72                                                        GRI09630
   73 CONTINUE                                                          GRI09640
      ELZZ=ELZ(NUMB,CCORD)                                              GRI09650
   74 CONTINUE                                                          GRI09660
      ELZ(NUMB,COORD)=ELZZ-ELL                                          GRI09670
      IF(ELZ(NUMB,CCORD) .LE. -Y1(NUMBR)) GO TO 75                      GRI09680
      ELY(NUMB,COORD)=(X1(NUMBR)+AB)*SIN(ALFAP)-SQRT((Y1(NUMBR))**2-    GRI09690
     1(ELZ(NUMB,COORD))**2)*COS(ALFAP)                                  GRI09700
      ELZZ=ELZ(NUMB,CCORD)                                              GRI09710
      IF(ELLIPS .EQ. 1) WRITE(6,1100)NUMBR,COORD,ELY(NUMB,CCORD),       GRI09720
     1ELZ(NUMB,COORD)                                                   GRI09730
      CCOR(NUMB)=CCORD                                                  GRI09740
      CCORD=CCORD+1                                                     GRI09750
      GO TO 74                                                          GRI09760
   75 CONTINUE                                                          GRI09770
      NUMBR=NUMBR+(K-1)/ELLNUM                                          GRI09780
      NUMB=NUMB+1                                                       GRI09790
      IF(NUMBR .GT. K) GO TO 76                                         GRI09800
      GO TO 71                                                          GRI09810
   76 CONTINUE                                                          GRI09820
      IF(ELLIPS .EQ. 1) WRITE(6,1200)                                   GRI09830
      NUMB=NUMB-1                                                       GRI09840
C                                                                       GRI09850
C     IMAGE PLANE SPOT DIAGRAM STATISTICAL ANALYSIS:                    GRI09860
C                                                                       GRI09870
      SUM1=0.0                                                          GRI09880
      DO 77 IZ=1,RAYS                                                   GRI09890
        IF(FLAG(IZ) .GT. 0) GO TO 77                                    GRI09900
          SUM1=YIM(IZ)+SUM1                                             GRI09910
   77 CONTINUE                                                          GRI09920
C     REFERENCE EACH ITERATION TO INCIDENT ANGLE & THICKNESS BY:        GRI09930
      IANGLE=ALFAP*IC                                                   GRI09940
      ITHICK=(T(1))*ICO                                                 GRI09950
C     CENTROID OF SPOT:                                                 GRI09960
      YCENTR(IANGLE,ITHICK)=SUM1/COUNT                                  GRI09970
C     STANDARD DEVIATIONS:                                              GRI09980
      SUM2=0.0                                                          GRI09990
      SUM3=0.0                                                          GRI10000
      DO 78 IZ=1,RAYS                                                   GRI10010
        IF(FLAG(IZ) .GT. 0) GO TO 78                                    GRI10020
        SUM2=YIM(IZ)**2+SUM2                                            GRI10030
        SUM3=(YCENTR(IANGLE,ITHICK)-YIM(IZ))**2+SUM3                    GRI10040
   78 CONTINUE                                                          GRI10050
      SIGMAZ(IANGLE,ITHICK)=SUM2/COUNT                                  GRI10060
      SIGMAY(IANGLE,ITHICK)=SUM3/COUNT                                  GRI10070
C     RCET MEAN SQUARE SPOT SIZE:                                       GRI10080
```

```
      RMSRAD(IANGLE,THICK)=SQRT(SIGMAZ(IANGLE,THICK)+SIGMAY(IANGLE,     GRI10090
     1THICK))                                                           GRI10100
  401 FORMAT('1','MIRROR IMAGE SKEW RAYS FOLLOW'///1X,'IMAGE'/2X,'RAY  'GRI10110
     1AY   RAYN      RAYZ       OPL        YIM        ZIM        NTNCTY GRI10120
     1      DCIAPT'/81X,'YDIAPT'//)                                     GRI10130
  501 FORMAT(14,1X,14,2F10.7,F13.9,3F11.7,F15.3/72X,F15.3/)             GRI10140
  601 FORMAT(14,1X,14,2F10.7,' NO INTERCEPT WITH 2ND SURFACE'/)         GRI10150
  701 FORMAT(14,1X,14,2F10.7,' INTERCEPT OUTSIDE OF BOUNDARY OF 2ND SURFGRI10160
     1ACE'/)                                                            GRI10170
  801 FORMAT(14,1X,14,2F10.7,' TOTAL INTERNAL REFLECTION'/)             GRI10180
  900 FORMAT(1X,'END OF SKEW RAY TRACE.'//3X,'TOTAL NUMBER OF RAYS TRACEGRI10190
     1D = ',I4/3X,'TOTAL NUMBER OF MIRROR IMAGE RAYS = ',I4/3X,'TOTAL NUGRI10200
     1MBER OF RAYS STRIKING IMAGE PLANE = ',I4)                         GRI10210
 1000 FORMAT('1','TWO DIMENSIONAL PROJECTION OF 3-DIM LENS'///3X,'GENERAGRI10220
     1TED ELLIPSES ARE REFERENCED TO THE CORRESPONDING JTH COORDINATE   IGRI10230
     1N THE MERIDIAN PLANES AS COMPUTED IN THE ABOVE'/3X,'GLM LENS SHAPEGRI10240
     1 ALGORITHM. INSIDE AND OUTSIDE ELLIPSES CORRESPOND TO THE OPAQUE AGRI10250
     1CLARITIES.'/3X,'THE NUMBER OF ELLIPSES GENERATED = ',I3//1X,'   J GRI10260
     1 COORD      ELY        ELZ'//)                                    GRI10270
 1100 FORMAT(1X,I4,4X,I4,2F10.7)                                        GRI10280
 1200 FORMAT(1X,'CALCULATION OF ELLIPSE COORDINATES COMPLETE.')          GRI10290
      RETURN                                                            GRI10300
      END                                                               GRI10310
                                                                        GRI10320
      SUBROUTINE SUMP                                                   GRI10330
      COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),PF            GRI10340
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        GRI10350
      COMMON/PT/SHAPE,SQURAY,ELLIPS,ICHECK                              GRI10360
      COMMON/SHP/II(1010),IIP(1010),I2(1010),I2P(1010)                  GRI10370
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    GRI10380
     2,J,UP(1010),DYDX1(1010),DYDX2(1010)                               GRI10390
      COMMON/SK/K,L,IZ,IZ1,M,N,NP1,FLAG(1010),IZ),RAYS,IZ2,DRAYS        GRI10400
     1,NUMBR,COORD,NUMP,ANGLE,THICK,IZ4,IZ5,COUNT,IZ6                   GRI10410
     2,COOR(500),NUMBT,COORT,GAMMA,AP,ONP,STATNA                        GRI10420
     3,RAYY(1010),RAYZ(1010),CENI,TCPRI,ROTI,TOPI                       GRI10430
     4,RADIUS,CEN,TCP,ECT,TORR,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         GRI10440
     5,AX,AY,AZ,RX,RY,RZ,AXI,AYI,AZI,PHII,PHIIP,TIRA                    GRI10450
     6,API,APJ,APK,THETA,PHI,PHIP,AO,BO,CO,DO,EO,PAR1,PAR2             GRI10460
     7,PAR3,XC,YC,ZC,AUP,CNP,CLP,CNP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI   GRI10470
     8,NUM5,CNPP,CLPP,CMPP,D3,CPLL(1010),DL,NUM6,NUM7,NTNCTY(1010)      GRI10480
     9,YIM(1010),ZIM(1010),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO        GRI10490
      COMMON/SM/NUMB,THETAI,XOIAPT(1010),YOIAPT(1010),SUM1              GRI10500
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           GRI10510
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1010),YCENTR(20,500)        GRI10520
C                                                                       GRI10530
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                           GRI10540
      INTEGER FLAG,RAYS,DRAYS,COORD,THICK,COUNT,COOR,COORT              GRI10550
      REAL N1,N2,N3                                                     GRI10560
      REAL II,IIP,I2,I2P                                                GRI10570
     1,AX,AY,AZ,RX,RY,RZ,AXI,AYI,AZI,PHII,PHIIP,TIRA                    GRI10580
      REAL NP1,APJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      GRI10590
     1,NTNCTY                                                           GRI10600
C                                                                       GRI10610
C WRITE PARAMETER SUMMARY HERE                                          GRI10620
C                                                                       GRI10630
      WRITE(6,1300)T(1),U,ALFAP,R,YCENTR(IANGLE,THICK),                 GRI10640
     1SIGMAY(IANGLE,THICK),SIGMAZ(IANGLE,THICK),RMSRAD(IANGLE,THICK)    GRI10650
C                                                                       GRI10660
C     SPOT DIAGRAM ENERGY DENSITY VS. RADIUS FROM CENTROID:             GRI10670
C                                                                       GRI10680
      DO 79 IZ=1,RAYS                                                   GRI10690
        IF(FLAG(IZ) .GT. 0) GO TO 79                                    GRI10700
        SDRAD(IZ)=SQRT((YCENTR(IANGLE,THICK)-YIM(IZ))**2+ZIM(IZ)**2)    GRI10710
   79 CONTINUE                                                          GRI10720
      IZ4=1                                                             GRI10730
      RCC(IZ4)=0.005                                                    GRI10740
      SUM4(IZ4)=0.0                                                     GRI10750
   80 CONTINUE                                                          GRI10760
      DO 81 IZ=1,RAYS                                                   GRI10770
        IF(FLAG(IZ) .GT. 0) GO TO 81                                    GRI10780
        IF(SDRAD(IZ) .LE. RCC(IZ4)) SUM4(IZ4)=1+SUM4(IZ4)               GRI10790
   81 CONTINUE                                                          GRI10800
```

```
      FRACTN(IZ4)=SUM4(IZ4)/RAYS                                        GRI10810
      WRITE(6,1400) IZ4,ROC(IZ4),FRACTN(IZ4)                            GRI10820
      IZ5=IZ4                                                           GRI10830
      IZ4=IZ4+1                                                         GRI10840
      RCC(IZ4)=RCC(IZ5)+0.005                                           GRI10850
      SUM4(IZ4)=0.0                                                     GRI10860
      IF(ROC(IZ4) .GT. 0.5) GO TO 82                                    GRI10870
      GO TO 80                                                          GRI10880
   82 CONTINUE                                                          GRI10890
      IZ6=IZ4-1                                                         GRI10900
      WRITE(6,1500)                                                     GRI10910
 1300 FORMAT('1',1X,'IMAGE PLANE SPOT DIAGRAM ANALYSIS:'///1X,'THICKNESSGRI10920
     1 =',F9.7,' U =',F9.7,' ALFAP =',F9.7,'  R =',F9.7//1X,'CENTROID:GRI10930
     1 ZCENTR = 0.0,  YCENTR = ',F10.7//1X,'STANDARD DEVIATIONS:  SIGMAYGRI10940
     1 = ',F10.7,2X,'SIGMAZ = ',F10.7//1X,'RMS SPOT SIZE: RMSRAD = 'GRI10950
     1F10.7///1X,'SPOT DIAGRAM ENERGY DENSITY VS. RADIUS FROM CENTROID:'GRI10960
     1//1X,' IZ4    RADIUS   FRACTION'//)                              GRI10970
 1400 FORMAT(14,2F11.7)                                                 GRI10980
 1500 FORMAT(1X,'SPOT DIAGRAM CALCULATIONS COMPLETE.')                  GRI10990
      RETURN                                                            GRI11000
      END                                                               GRI11010
                                                                        GRI11020
      SUBROUTINE PLOTT                                                  GRI11030
        COMMON/CT/F,ALPHA,U,I,R,T(1010),N1,N2,N3,BETA(1010),HF          GRI11040
     1,ALFAP,GRID,ELLNUM,ENUM,ELLBF,PI,RAD,ICASE                        GRI11050
        COMMON/PT/SHAPE,SQURAY,ELLIPS,ICHECK                            GRI11060
        COMMON/SHP/II(1010),IIP(1010),I2(1010),I2P(1010)                GRI11070
     1,ETA(101C),XI(1010),YI(1010),X2(1010),Y2(1010)                    GRI11080
     2,J,UP(1010),DYDXT(1010),DYDXN(1010)                               GRI11090
        COMMON/IN/AN2,BN2,XC,CIV,E,THETAE,RO                            GRI11100
        COMMON/SKK/L,IZ,IZ1,M,N,NP1,FLAG(1010),IZ0,RAYS,IZ2,DRAYS       GRI11110
     1,NUMBR,CCORD,NUMB,IANGLE,THICK,IZ4,IZ5,COUNT,IZ6                  GRI11120
     2,CCOR(5CC),NUMBT,COORT,GAMMA,AB,ONP,STATNA                        GRI11130
     3,RAYY(1010),RAYZ(1010),CENI,TORBI,BOTI,TOPI                       GRI11140
     4,RADIUS,CEN,TOP,BOT,TORB,DELTAX,DELTAY,SP,ST,RATIO,DYDXNP         GRI11150
     5,AX,NY,AZ,RX,RY,RZ,AXI,NYI,NZI,PHII,PHIIP,TIRA                    GRI11160
     6,NPI,NPJ,NPK,THETA,PHI,PHIP,A0,B0,C0,D0,E0,PAR1,PAR2              GRI11170
     7,PAR3,XC,YC,ZC,NUM,CKP,CLP,CMP,NUM1,NUM2,NUM3,NUM4,D2,XI,YI,ZI    GRI11180
     8,NUM5,CKEP,CLPP,CMPP,D3,OPL(1010),D1,NUM6,NUM7,MTNCTY(1010)       GRI11190
     9,YIM(101C),ZIM(1010),ELL,ELY(7,1000),ELZ(7,1000),ELZZ,ZOYO        GRI11200
        COMMON/SM/NUM8,THETA1,XDIAPT(1010),YDIAPT(1010),SUM1            GRI11210
     1,SUM2,SUM3,SIGMAZ(10,500),SIGMAY(10,500),RMSRAD(10,500)           GRI11220
     2,RCC(300),SUM4(300),FRACTN(300),SDRAD(1010),YCENTR(20,500)        GRI11230
C                                                                       GRI11240
      INTEGER ELLNUM,ENUM,SHAPE,SQURAY,ELLIPS                           GRI11250
      INTEGER FLAG,RAYS,DRAYS,CCORD,THICK,COUNT,COOR,COORT              GRI11260
      REAL N1,N2,N3                                                     GRI11270
      REAL I1,IIP,I2,I2P                                                GRI11280
     1,AX,NY,AZ,RX,RY,RZ,AXI,NYI,NZI,PHII,PHIIP,TIRA                    GRI11290
      REAL NPI,NPJ,NPK,NUM,NUM1,NUM2,NUM3,NUM4,NUM5,NUM6,NUM7,NUM8      GRI11300
     1,MTNCTY                                                           GRI11310
C                                                                       GRI11320
C     PLOT OUTPUT                                                       GRI11330
C                                                                       GRI11340
C     WRITE OUTPUT FOR PLOT INTO FILE FT01F001                          GRI11350
C                                                                       GRI11360
C                                                                       GRI11370
      WRITE(1,831F,ALPHA,U,I,R,T(1),N1,N2,N3,ALFAP,GRID,STATNA,GAMMA    GRI11380
     1,RAYS,CCUNT,K,IZC,IANGLE,THICK,XC,CIV                             GRI11390
   83 FORMAT(' ',3F9.7,I4,4F9.7/' ',3F9.7,F9.5,F9.7// ' ',6I4,2F8.5)    GRI11400
      DO 85 J=1,K                                                       GRI11410
         WRITE(1,84)X1(J),Y1(J),X2(J),Y2(J)                             GRI11420
   84    FORMAT(' ',4F10.7)                                             GRI11430
   85 CONTINUE                                                          GRI11440
      DO 88 IZ=1,RAYS                                                   GRI11450
         WRITE(1,86)RAYY(IZ),RAYZ(IZ),FLAG(IZ)                          GRI11460
   86    FORMAT(' ',2F10.7,3X,I1)                                       GRI11470
         IF(FLAG(IZ) .GT. 1) GO TO 88                                   GRI11480
           WRITE(1,87)YIM(IZ),ZIM(IZ)                                   GRI11490
   87      FORMAT(' ',2F10.7)                                           GRI11500
   88 CONTINUE                                                          GRI11510
      DO 90 IZ4=1,IZC                                                   GRI11520
```

```
      WRITE(1,89)RCC(IZ4),ERACTN(IZ4)                                   GRI11530
   89 FORMAT(' ',F10.7,2X,F10.7)                                        GRI11540
   90 CONTINUE                                                          GRI11550
      WRITE(1,91)YCENTR(IANGLE,THICK),SIGMAY(IANGLE,THICK),             GRI11560
     1SIGMAZ(IANGLE,THICK),RMSRAD(IANGLE,THICK),NUMAT                   GRI11570
   91 FORMAT(' ',4F10.7,I4)                                             GRI11580
      DO 96 NUMB=1,NUMPT                                                GRI11590
      WRITE(1,92)CCOR(NUMB)                                             GRI11600
   92 FORMAT(' ',I3)                                                    GRI11610
      COORT=CCOR(NUMB)                                                  GRI11620
      DO 95 COORD=1,COORT                                               GRI11630
      WRITE(1,94)FLY(NUMB,COORD),FLZ(NUMB,COORD)                        GRI11640
   94 FORMAT(' ',F11.4,3X,F11.8)                                        GRI11650
   95 CONTINUE                                                          GRI11660
   96 CONTINUE                                                          GRI11670
      WRITE(1,97)                                                       GRI11680
   97 FORMAT(' ','/*')                                                  GRI11690
      WRITE(6,98)                                                       GRI11700
   98 FORMAT(' ','TO OBTAIN PLOTS FROM THE PLOTTER OR THE PRINTER,'/' ',GRI11710
     1'ISSUE THE FOLLOWING COMMAND: '/' ',8X,'FOR PRINTER PLOTS',       GRI11720
     1T36,'ENTER "LENSCOM PRINTER"'/' ',8X,'FOR PLOTTER GRAPHS',T36,    GRI11730
     1'ENTER "LENSCOM PLOTTER"')                                        GRI11740
      WRITE(6,99)                                                       GRI11750
   99 FORMAT(' ','END OF PROGRAM')                                      GRI11760
      RETURN                                                            GRI11770
      END                                                               GRI11780
                                                                        GRI11790
      SUBROUTINE INDEX(R,RF,N2)                                         GRI11800
      COMMON/IN/AN2,BN2,XC,DIV,E,THETAE,R0                              GRI11810
      REAL N2                                                           GRI11820
      N2=SQRT(AN2+BN2*(R/R0)**2)                                        GRI11830
      RETURN                                                            GRI11840
      END                                                               GRI11850
                                                                        GRI11860
      SUBROUTINE RADN2(R,RF,EPSI)                                       GRI11870
      COMMON/PT/SHAPE,SCURAY,ELLIPS,ICHECK                              GRI11880
      COMMON/IN/AN2,BN2,XC,DIV,E,THETAE,R0                              GRI11890
      COMMON/RA/BR1,BR2                                                 GRI11900
C     R IS THE OUTPUT RADIUS;R0 IS THE INPUT RADIUS                     GRI11910
C     AT SHAPE1, WHEN J=1 BR IS COMPUTED FROM KNOWN RF(EPSI=-1.0)       GRI11920
C                WHEN J.GT.1 RF IS COMPUTED FROM KNOWN RR(EPSI=1.0)     GRI11930
C     AT SKEW1, BR IS COMPUTED FROM KNOWN RF(EPSI=-1.0)                 GRI11940
      DEC=(AN2**2+4.0*BN2*(E/R0)**2)                                    GRI11950
      IF(DEC.GT.0.0)GO TO 10                                            GRI11960
      WRITE(6,30)AN2,BN2,E,R0,RF,DEC                                    GRI11970
      STOP                                                              GRI11980
   10 BR1=SQRT(AN2**2+4.0*BN2*(E/R0)**2)                                GRI11990
      BR2=(2.0*(E/RF)**2-AN2)/BR1                                       GRI12000
      DEL=ABS(BR2)-1.0                                                  GRI12010
      IF(DEL.LE.0.0)GO TO 15                                            GRI12020
      IF(BR2.GT.1.0)GO TO 13                                            GRI12030
      BR2=-1.0                                                          GRI12040
      GO TO 15                                                          GRI12050
   13 BR2=1.0                                                           GRI12060
   15 DEC=(AN2+BR1*SIN(EPSI*2.0*THETAE+ARSIN(BR2)))                     GRI12070
      IF(DEC.GT.0.0)GO TO 20                                            GRI12080
      IF(SCURAY.GE.2)WRITE(6,31)AN2,BN2,E,R0,RF,DEC,BR1,BR2,THETAE      GRI12090
      R=-1.0                                                            GRI12100
      RETURN                                                            GRI12110
   20 R=SQRT(2.0*E**2/(AN2+BR1*SIN(EPSI*2.0*THETAE+ARSIN(BR2))))        GRI12120
   30 FORMAT(2X,'NEGETIVE RESULTS IN RADN2'/2X,5E8.4,E10.3)             GRI12130
   31 FORMAT(2X,5E8.4,E10.3,3E8.4)                                      GRI12140
      RETURN                                                            GRI12150
      END                                                               GRI12160
                                                                        GRI12170
      SUBROUTINE ITER                                                   GRI12180
      COMMON/ET/F,ALPHA,U,I,R,I1(1010),N1,N2,N3,BETA(1010),RF           GRI12190
     1,ALFAP,GRID,ELLNUM,ENUM,ELLRF,PI,RAD,ICASE                        GRI12200
      COMMON/PT/SHAPE,SCURAY,ELLIPS,ICHECK                              GRI12210
      COMMON/SHP/I1(1010),I1P(1010),I2(1010),I2P(1010)                  GRI12220
     1,ETA(1010),X1(1010),Y1(1010),X2(1010),Y2(1010)                    GRI12230
     2,J,UP(1010),DYEXT(1010),DYDXN(1010)                               GRI12240
```

```
      COMMON/IN/AN2,BN2,XC,DIV,E,THETAE,R0                              GRI12250
      COMMON/GN/RR(1010),RF(1010),THETA0,TOTE,PSI,PSI0                  GRI12260
      COMMON/RA/BR1,BR2                                                 GRI12270
      REAL N1,N2,N3                                                     GRI12280
      REAL I1,I1P,I2,I2P                                                GRI12290
     1,AX,NY,NZ,RX,RY,RZ,NXI,NYI,NZI,PHII,PHIIP,TIRA                    GRI12300
C                                                                       GRI12310
      ILOOP=1                                                           GRI12320
      EPS=1.E-05                                                        GRI12330
      EPSI=1.0                                                          GRI12340
      IF(J.EQ.1)EPSI=-1.0                                               GRI12350
   12 CALL RADN2(RFF,RR(J),EPSI)                                        GRI12360
      RF(J)=XC*TAN(ALPHA)/(SIN(TOTE)-TAN(ALPHA)*COS(TOTE))              GRI12370
      FX=RFF-RF(J)                                                      GRI12380
      F1P=-EPSI*0.5/E**2*(RFF**3)*FR1*COS(EPSI*2.0*THETAE+ARSIN(BR2))   GRI12390
      F2P=-XC*TAN(ALPHA)*(COS(TOTE)+TAN(ALPHA)*SIN(TOTE))               GRI12400
     1/((SIN(TOTE)-TAN(ALPHA)*COS(TOTE))**2)                            GRI12410
      FXDOT=F1P-F2P                                                     GRI12420
      XNEW=THETAE-FX/FXDOT/1.3                                          GRI12430
   13 DIFF=ABS(THETAE-XNEW)                                             GRI12440
      IF(DIFF.GT.EPS)GO TO 15                                           GRI12450
      RETURN                                                            GRI12460
   15 IF(ILOOP.GT.90)RETURN                                             GRI12470
      ILOOP=ILOOP+1                                                     GRI12480
      THETAE=XNEW                                                       GRI12490
      CALL POINTS                                                       GRI12500
      CALL FRONT                                                        GRI12510
      GO TO 12                                                          GRI12520
   19 CONTINUE                                                          GRI12530
      IF(SQUARY.GE.2)WRITE(6,10)J,THETAE,DIFF                           GRI12540
   10 FORMAT(1X,'SUITABLE SOLUTION WAS NOT FOUND AFTER 90  ITER'        GRI12550
     1,3X,I4,3X,F7.4,3X,E8.2)                                           GRI12560
   20 FORMAT(1X,I4,F7.4,3X,E8.2)                                        GRI12570
      STOP                                                              GRI12580
      END                                                               GRI12590
                                                                        GRI12600
      SUBROUTINE DIRECT(CKP,CLP,CMP)                                    GRI12610
      COMMON/DIR/RRX,RRY,RRZ,NPFX,NPFY,NPFZ,PSIR                        GRI12620
      REAL NPFX,NPFY,NPFZ                                               GRI12630
      EPS=1.0E-06                                                       GRI12640
      SIGN=+1.0                                                         GRI12650
      IF((ABS(NPFX)).GT.EPS)GO TO 50                                    GRI12660
      IF((ABS(NPFY)).GT.EPS)GO TO 30                                    GRI12670
      IF((ABS(RRY)).LT.EPS)GO TO 25                                     GRI12680
         CMP=0.0                                                        GRI12690
      APP=1.0+(RRX/RRY)**2                                              GRI12700
      BPP=COS(PSIR)*RRX/RRY**2                                          GRI12710
      CPP=(COS(PSIR)/RRY)**2-1.0                                        GRI12720
         CKP=BPP/APP+SIGN*SQRT(BPP**2-APP*CPP)/APP                      GRI12730
         CLP=(COS(PSIR)-RRX*CKP)/RRY                                    GRI12740
         RETURN                                                         GRI12750
   25    CMP=0.0                                                        GRI12760
         CKP=COS(PSIR)/RRX                                              GRI12770
         CLP=SIGN*SQRT(1.0-CKP**2)                                      GRI12780
         RETURN                                                         GRI12790
   30 IF((ABS(NPFZ)).GT.EPS)GO TO 40                                    GRI12800
      IF((ABS(RRZ)).LT.EPS)GO TO 35                                     GRI12810
         CLP=0.0                                                        GRI12820
      APP=1.0+(RRX/RRZ)**2                                              GRI12830
      BPP=COS(PSIR)*RRX/RRZ**2                                          GRI12840
      CPP=(COS(PSIR)/RRZ)**2-1.0                                        GRI12850
         CKP=BPP/APP+SQRT(BPP**2-APP*CPP)/APP                           GRI12860
         CMP=(COS(PSIR)-RRX*CKP)/RRZ                                    GRI12870
         RETURN                                                         GRI12880
   35    CLP=0.0                                                        GRI12890
         CKP=COS(PSIR)/RRX                                              GRI12900
         CMP=SIGN*SQRT(1.0-CKP**2)                                      GRI12910
         RETURN                                                         GRI12920
   40 IF((ABS(RRX)).GT.EPS)GO TO 45                                     GRI12930
         CLP=COS(PSIR)/(RRY-NPFY/NPFZ*RRZ)                              GRI12940
         CMP=-NPFY/NPFZ*CLP                                             GRI12950
         CKP=SIGN*SQRT(1.0-CLP**2-CMP**2)                               GRI12960
```

```
      RETURN                                                            GRII2970
   45 IF((ABS(RRY-NPFY/NPFZ*RRZ)).GT.EPS)GO TO 47                       GRII2980
      CKP=COS(PSIR)/RRX                                                 GRII2990
      CLP=SIGN*SQRT(1.0-CKP**2)/(1.0+(NPFY/NPFZ)**2)                    GRII3000
      CMP=-NPFY/NPFZ*CLP                                                GRII3010
      RETURN                                                            GRII3020
   47 SIGN=-1.0                                                         GRII3030
      IF(RRY.LT.0.0)SIGN=+1.0                                           GRII3040
      APP=((RRY-NPFY/NPFZ*RRZ)/RRX)**2+1.0)+(NPFY/NPFZ)**2              GRII3050
      BPP=2.0*COS(PSIR)/(RRX**2)*(RRY-NPFY/NPFZ*RRZ)                    GRII3060
      CPP=(COS(PSIR)/RRX)**2-1.0                                        GRII3070
      CLP=BPP/(2.0*APP)+SIGN*SQRT(BPP**2-4.0*APP*CPP)/(2.0*APP)         GRII3080
      CMP=-NPFY/NPFZ*CLP                                                GRII3090
      CKP=(COS(PSIR)-(RRY-NPFY/NPFZ*RRZ)*CLP)/RPX                       GRII3100
      RETURN                                                            GRII3110
   50 SIGN=-1.0                                                         GRII3120
      IF(RRY.LT.0.0)SIGN=+1.0                                           GRII3130
      AA=NPFX*RRY-NPFY*RRX                                              GRII3140
      BB=NPFX*RRZ-NPFZ*RRX                                              GRII3150
      CC=NPFX*COS(PSIR)                                                 GRII3160
      IF((ABS(EP)).GT.EPS)GO TO 60                                      GRII3170
      CLP=CC/AA                                                         GRII3180
      APF=(NPFZ/NPFX)**2+1.0                                            GRII3190
      BPF=NPFY*NPFZ/NPFX**2*CLP                                         GRII3200
      CPP=((NPFY/NPFX)**2+1.0)*CLP**2-1.0                               GRII3210
      CMP=-BPP/APP+SIGN*SQRT(BPP**2-APP*CPP)/APP                        GRII3220
      CKP=(-NPFY*CLP-NPFZ*CMP)/NPFX                                     GRII3230
      RETURN                                                            GRII3240
   60 AP=(NPFY/NPFX)**2+1.0                                             GRII3250
      BP=(NPFZ/NPFX)**2+1.0                                             GRII3260
      CP=2.0*NPFY*NPFZ/NPFX**2                                          GRII3270
      APP=AP+BP*(AA/BB)**2-CP*AA/BB                                     GRII3280
      BPP=2.0*AA*CC*PP/BB**2-CP*CC/BB                                   GRII3290
      CPP=BP*(CC/BB)**2-1.0                                             GRII3300
      CLP=BPP/(2.0*APP)+SIGN*SQRT(BPP**2-4.0*APP*CPP)/(2.0*APP)         GRII3310
      CMP=CC/BB-AA/BB*CLP                                               GRII3320
      CKP=(-NPFY*CLP-NPFZ*CMP)/NPFX                                     GRII3330
      RETURN                                                            GRII3340
      END                                                               GRII3350
```

## 11. PRELIMINARY RESULTS

Table 1. Comparison of RMS Spot size for a homogeneous lens with the RMS Spot size for a GRIN lens.

| $\alpha_p$ \ DIV | 0 | +0.05 | -0.05 |
|---|---|---|---|
| 0. | 0.0057336 | 0.0069021 | 0.005286 |
| 0.1 | 0.027424 | 0.027646 | 0.027327 |
| 0.2 | 0.06277 | 0.06288 | 0.06304 |
| 0.3 | 0.113431 | 0.11216 | 0.113245 |
| 0.4 | 0.18265 | 0.18287 | 0.18277 |

Note: DIV is the fractional variation of refractive index. $\alpha_p$ is the angle of incoming parallel rays relative to lens axis; $\alpha_p$ has dimensions of radians. The center of symmetry $X_c$ was at -0.07 measured from the apex of the outer surface. The minus sign indicates that $X_c$ is external to lens.

## RESULTS FROM LENS

(ICASE = 1)

Input: $\alpha_p = 0.0, 0.2, 0.4$

SUMMARY OF RESULTS

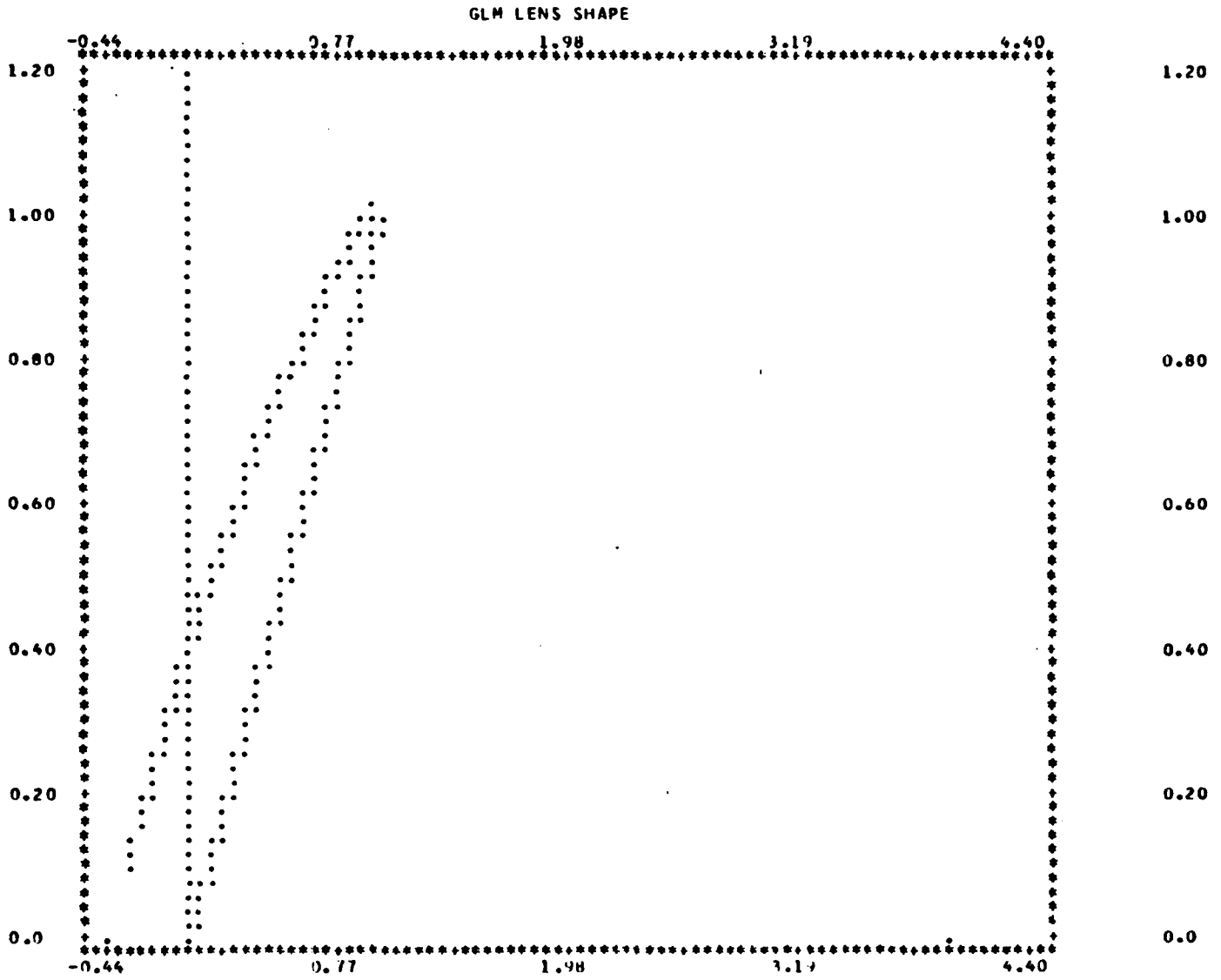
FOCAL LENGTH = 4.0000000 ALPHA = 0.7853979 U = 0.0 I = 1008

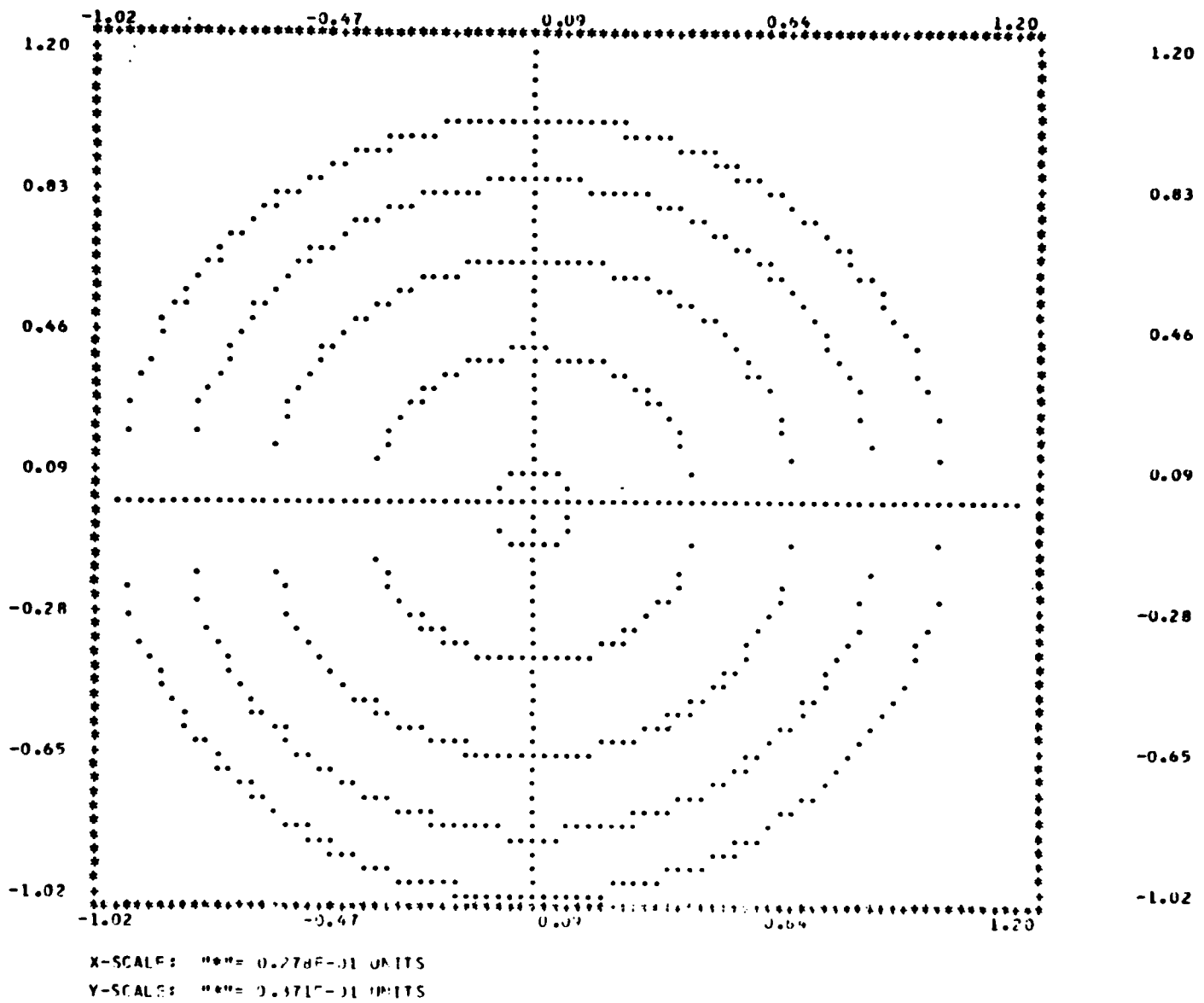
R = 1.0000000 T = 0.0500000 INDICES OF REFRACTION ARE: N1 = 1.0000000 N2 = 1.5000000 N3 = 1.0000000

ALFAP = 0.0 GRID = 0.1000000 STATNA = -0.44171 GAMMA = 0.7850314 XC=0.0 DIV=0.0

RAYS = 328 COUNT = 328 YCENTR = 0.0 SIGMAY = 0.0 SIGMAZ = 0.0

RMSRAD = 0.0000052


GLM LENS SHAPE
-0.44
0.77
1.98
3.19
4.40
1.20
1.00
0.80
0.60
0.40
0.20
0.0
X-SCALE: "*"= 0.605E-01 UNITS
Y-SCALE: "*"= 0.200E-01 UNITS


OBJECT PLANE
-1.02
-0.47
0.09
0.64
1.20
1.20
0.83
0.46
0.09
-0.28
-0.65
-1.02
X-SCALE: "*"= 0.278E-01 UNITS
Y-SCALE: "*"= 0.371E-01 UNITS

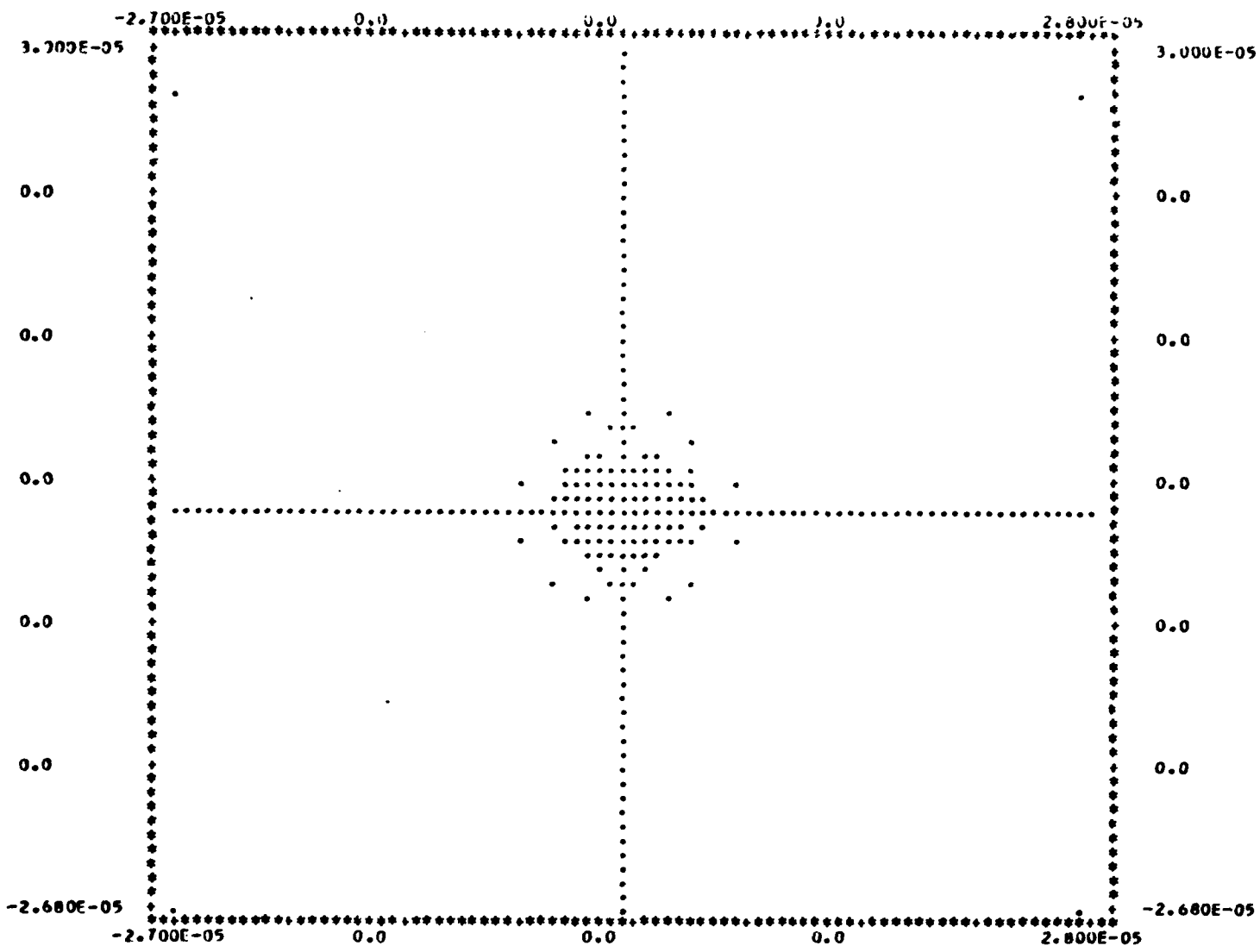


IMAGE PLANE
-2.700E-05
0.0
0.0
0.0
2.800E-05
3.000E-05
0.0
0.0
0.0
0.0
0.0
-2.680E-05
-2.700E-05
0.0
0.0
0.0
2.800E-05
X-SCALE: "*"= 0.687E-06 UNITS
Y-SCALE: "*"= 0.947E-06 UNITS

SUMMARY OF RESULTS

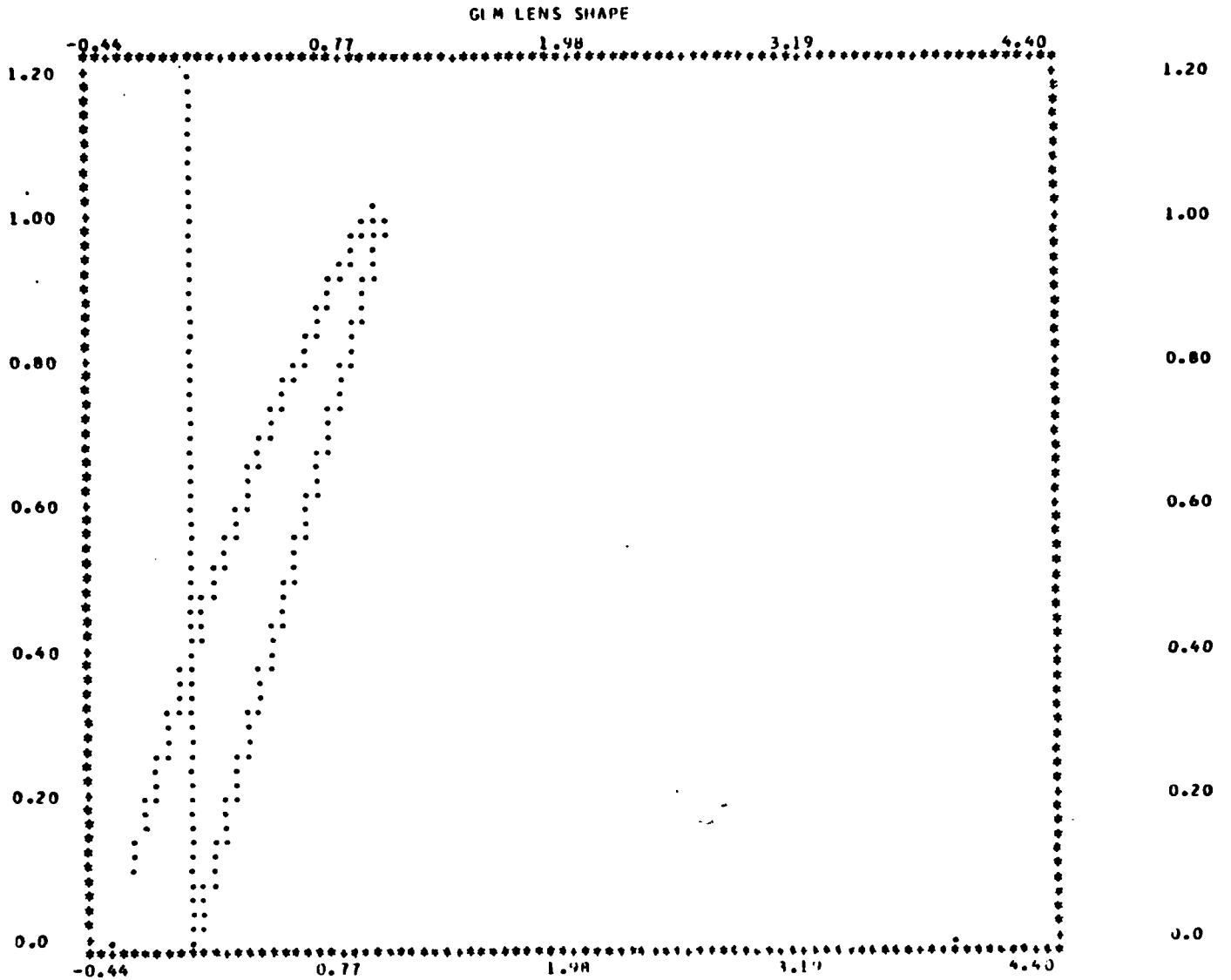
FOCAL LENGTH = 4.0000000 ALPHA = 0.7853979 U = 0.0 I = 1008

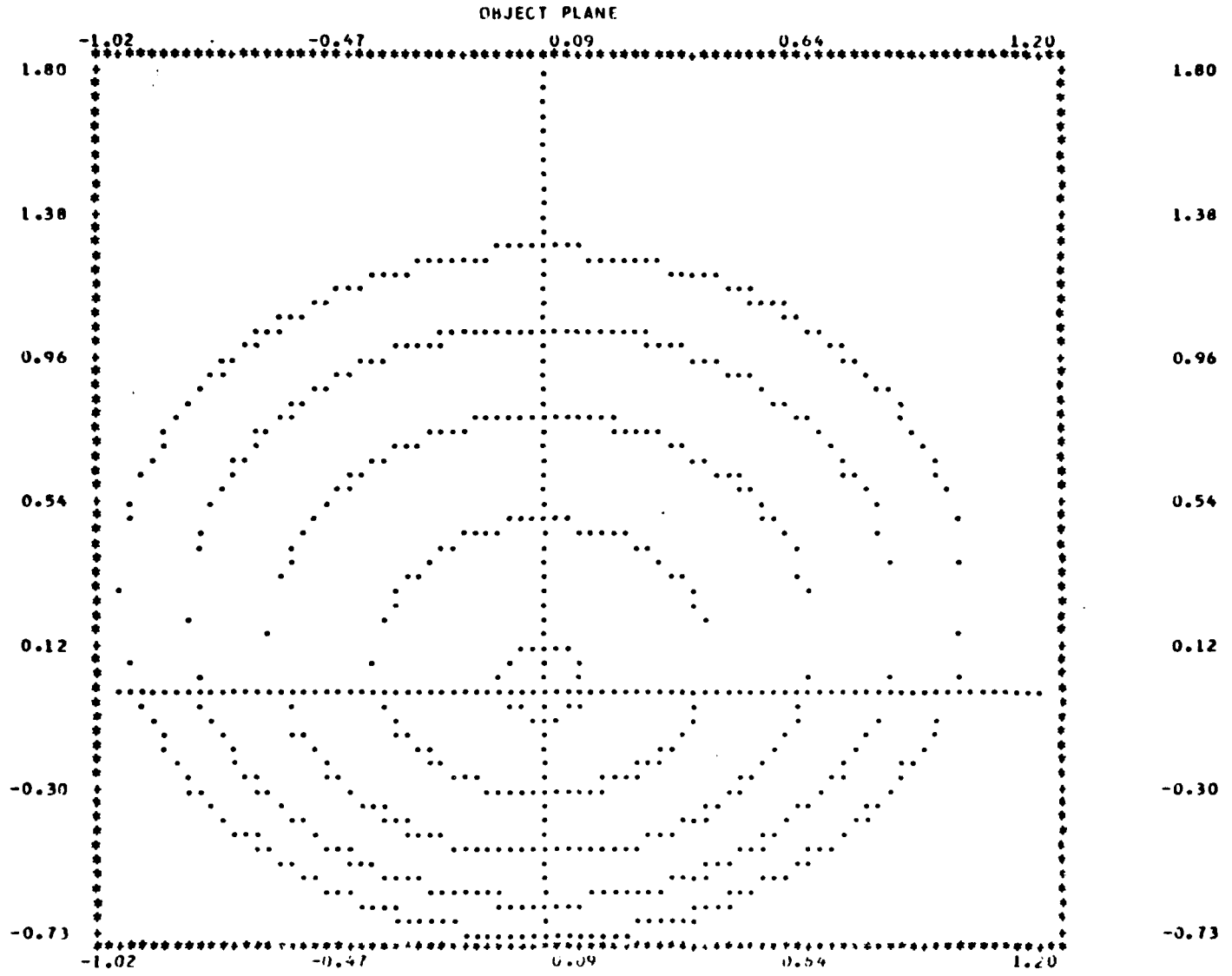
R = 1.0000000 T = 0.0500000 INDICES OF REFRACTION ARE: N1 = 1.0000000 N2 = 1.5000000 N3 = 1.0000000

ALFAP = 0.2000000 GRID = 0.1000000 STATNA = -0.44171 GAMMA = 0.7850314 XC=0.0 DIV=0.0

RAYS = 320 COUNT = 286 YCENTR = -0.6992106 SIGMAY = 0.0386393 SIGMAZ = 0.0164104

RMSRAD = 0.2346267


GLM LENS SHAPE
-0.44
0.77
1.98
3.19
4.40
1.20
1.00
0.80
0.60
0.40
0.20
0.0
X-SCALE: "*"= 0.605E-01 UNITS
Y-SCALE: "*"= 0.200E-01 UNITS


OBJECT PLANE
-1.02
-0.47
0.09
0.64
1.20
1.80
1.38
0.96
0.54
0.12
-0.30
-0.73
X-SCALE: "*"= 0.27[illegible]-01 UNITS
Y-SCALE: "*"= 0.42[illegible]-01 UNITS

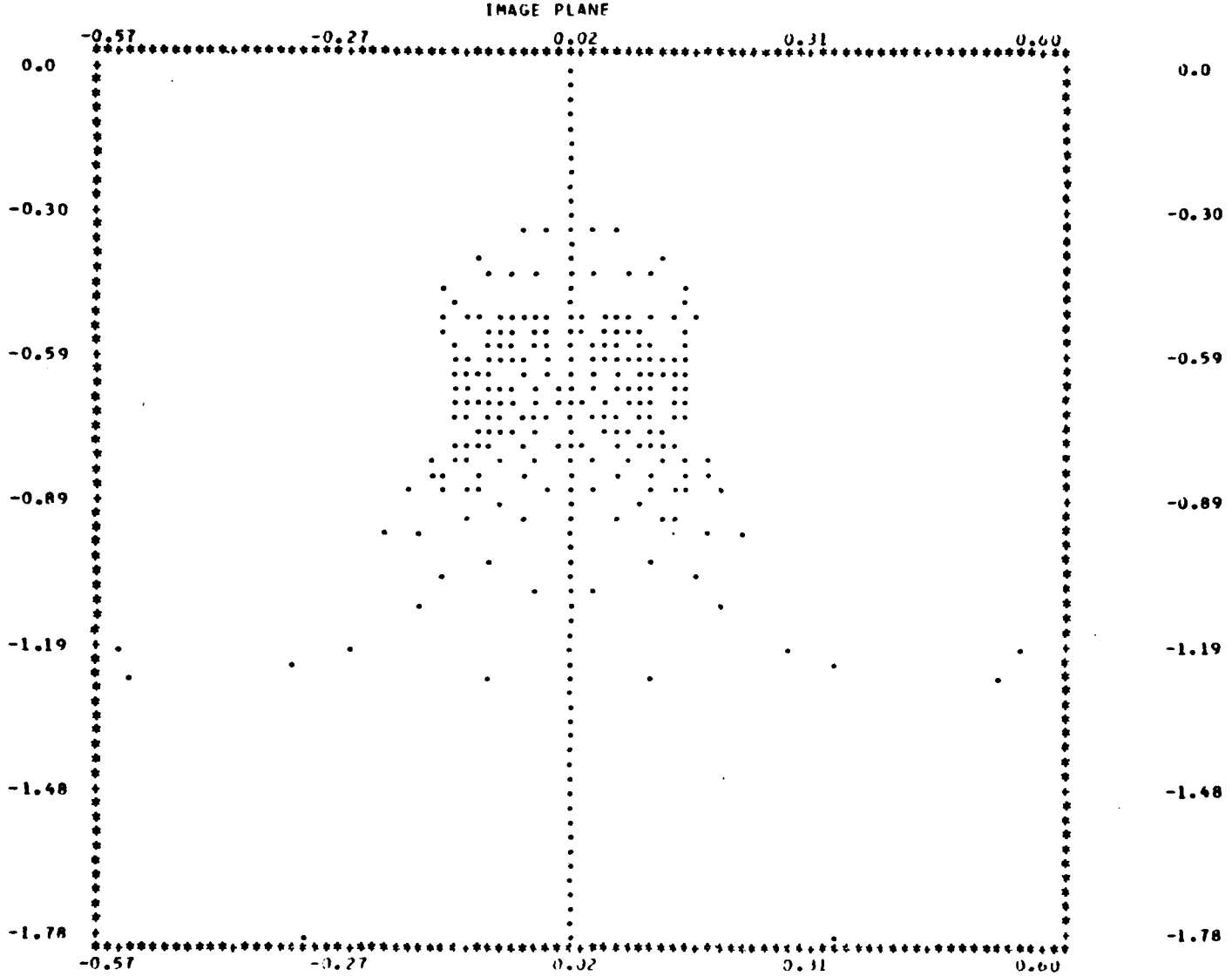
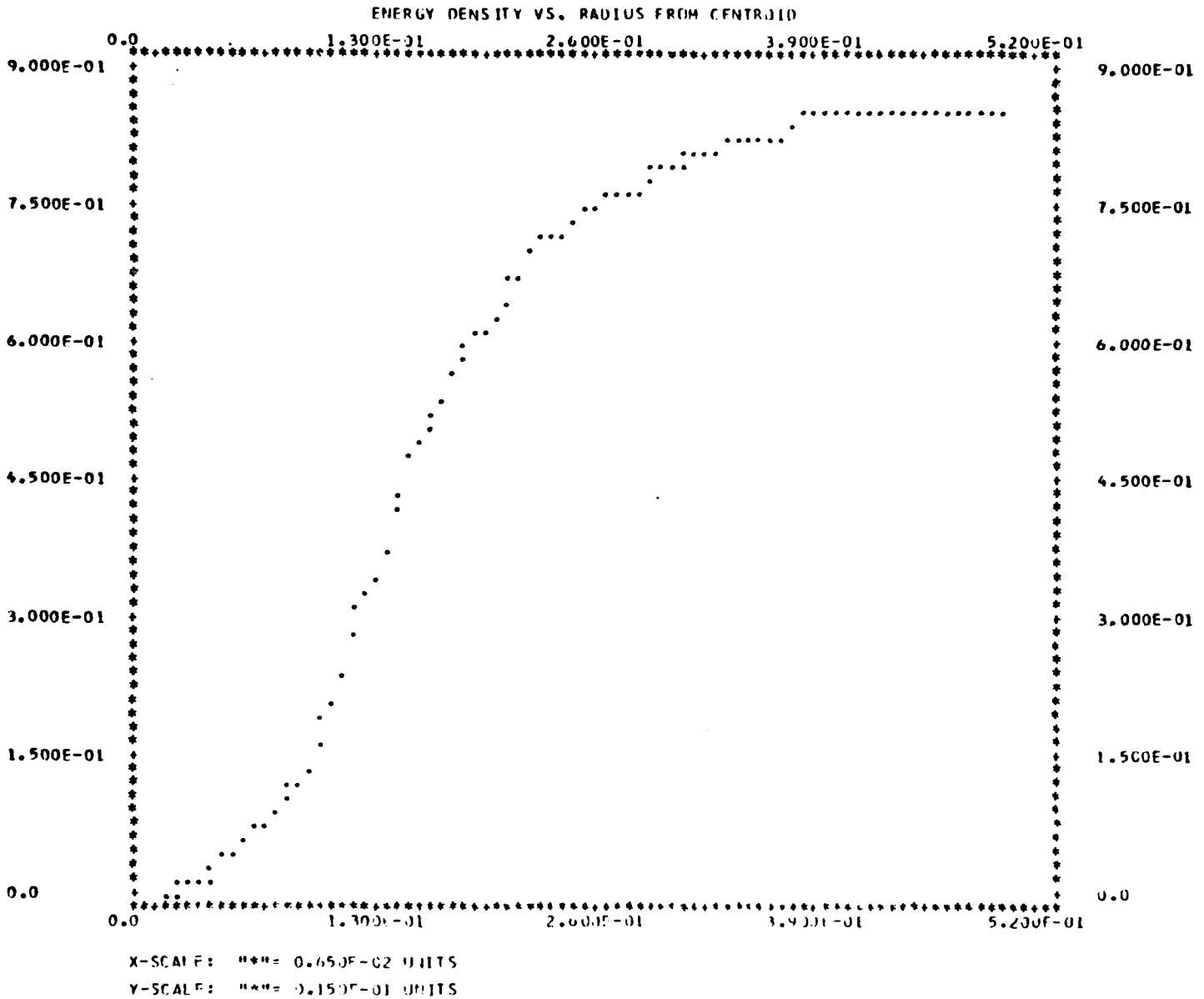


IMAGE PLANE
-0.57
-0.27
0.02
0.31
0.60
0.0
-0.30
-0.59
-0.89
-1.19
-1.48
-1.78
X-SCALE: "*"= 0.146E-01 UNITS
Y-SCALE: "*"= 0.297E-01 UNITS


ENERGY DENSITY VS. RADIUS FROM CENTROID
0.0
1.300E-01
2.600E-01
3.900E-01
5.200E-01
9.000E-01
7.500E-01
6.000E-01
4.500E-01
3.000E-01
1.500E-01
0.0
X-SCALE: "*"= 0.650E-02 UNITS
Y-SCALE: "*"= 0.150E-01 UNITS

SUMMARY OF RESULTS

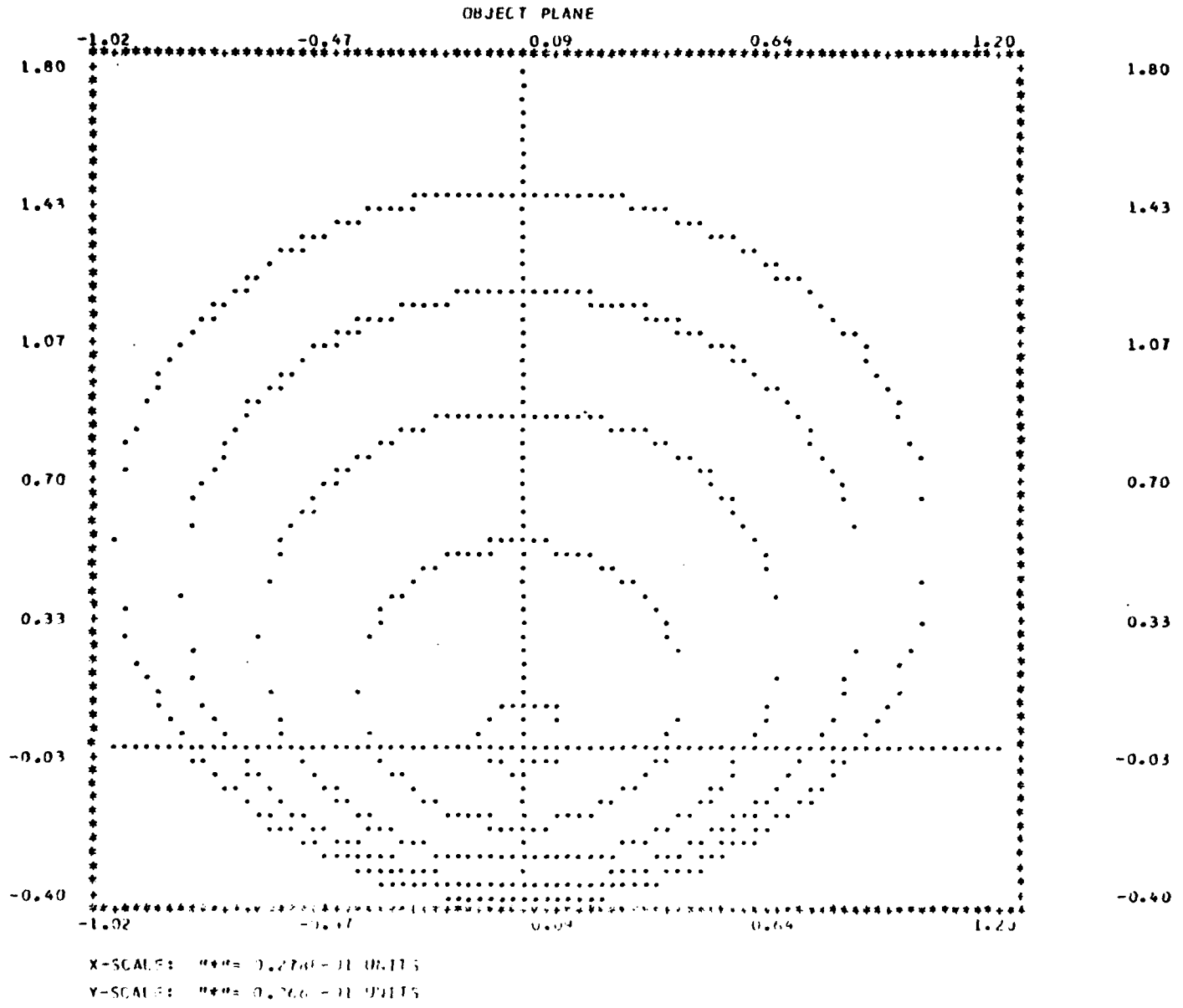
FOCAL LENGTH = 4.0000000 ALPHA = 0.7853979 U = 0.0 I = 1008

R = 1.0000000 T = 0.0500000 INDICES OF REFRACTION ARE: N1 = 1.0000000 N2 = 1.5000000 N3 = 1.0000000

ALFAP = 0.4000000 GRID = 0.1000000 STATNA = -0.44171 GAMMA = 0.7850314 XC=0.0 DIV=0.0

RAYS = 302 COUNT = 241 YCENTR = -1.4999914 SIGMAY = 0.1186211 SIGMAZ = 0.0549298

RMSRAD = 0.4165944


OBJECT PLANE
-1.02
-0.47
0.09
0.64
1.20
1.80
1.43
1.07
0.70
0.33
-0.03
-0.40
X-SCALE:
Y-SCALE:

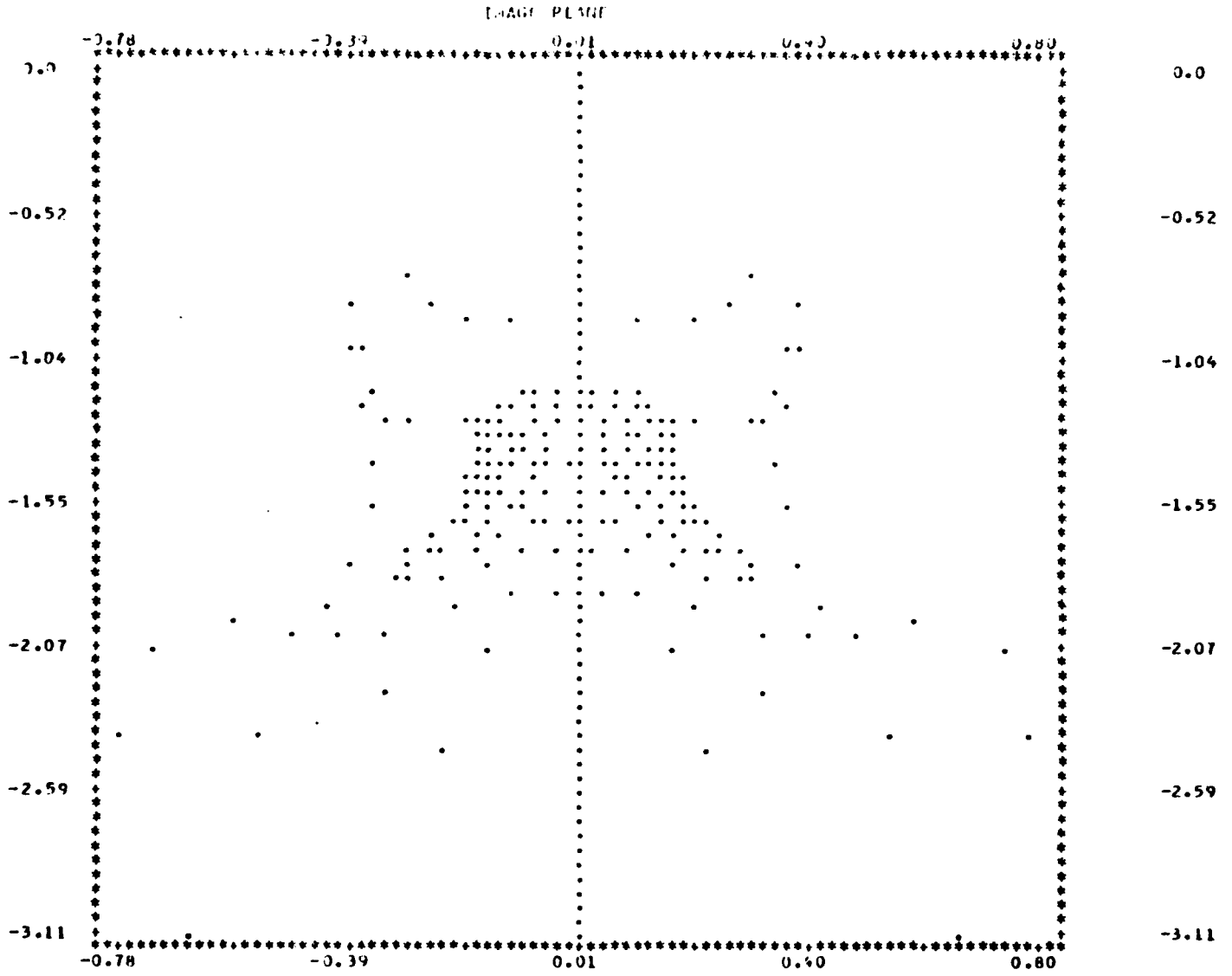
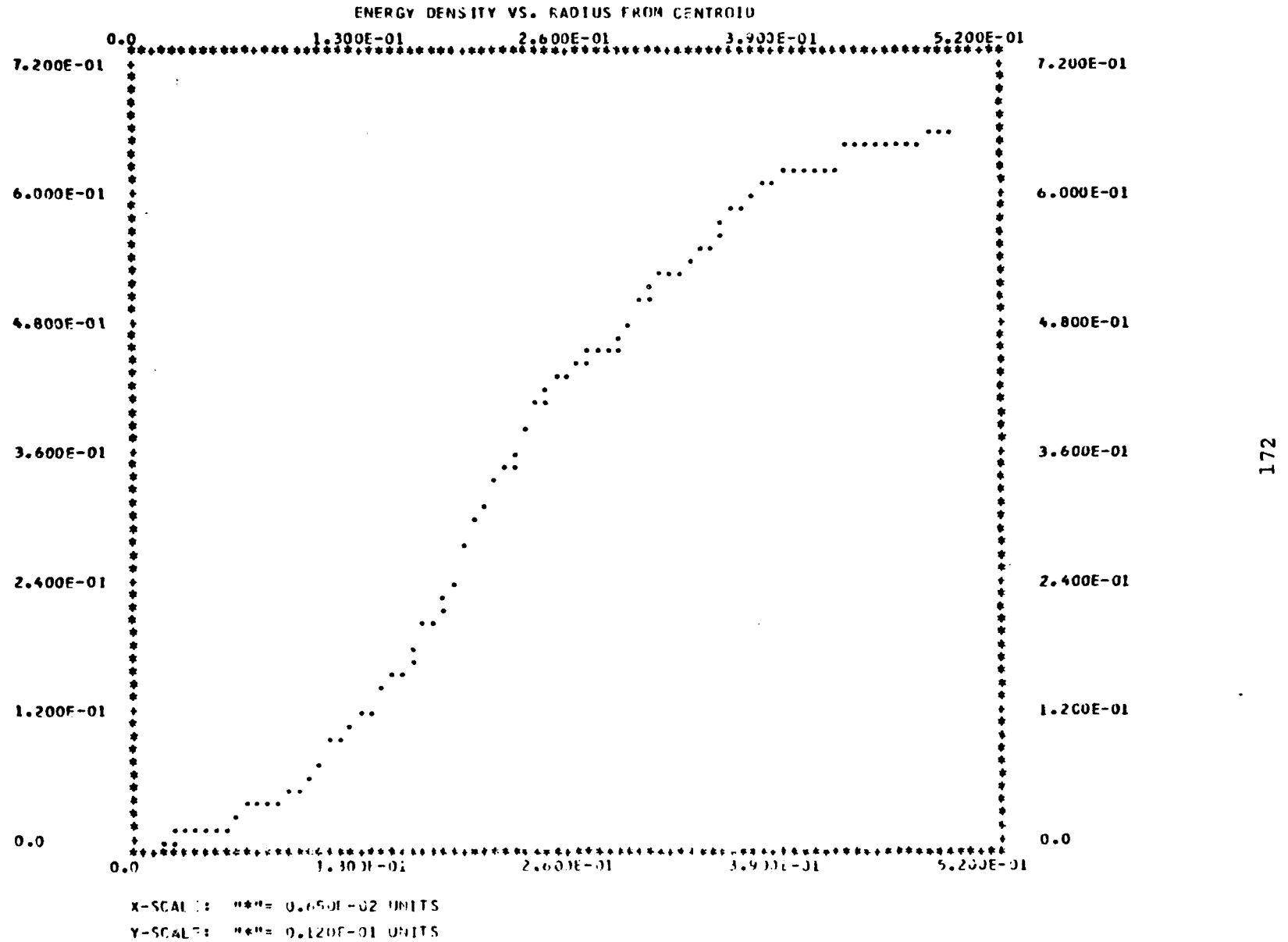


IMAGE PLANE
-0.78
-0.39
0.01
0.40
0.80
0.0
-0.52
-1.04
-1.55
-2.07
-2.59
-3.11
X-SCALE: "*"= 0.198E-01 UNITS
Y-SCALE: "*"= 0.518E-01 UNITS


ENERGY DENSITY VS. RADIUS FROM CENTROID
0.0
1.300E-01
2.600E-01
3.900E-01
5.200E-01
7.200E-01
6.000E-01
4.800E-01
3.600E-01
2.400E-01
1.200E-01
0.0
X-SCALE: "*"= 0.650E-02 UNITS
Y-SCALE: "*"= 0.120E-01 UNITS

## RESULTS FROM GRIN

(ICASE = 2)

Input: $X_c = -0.07$, DIV = +0.05

$\alpha_p = 0.0, \quad 0.1$

SUMMARY OF RESULTS

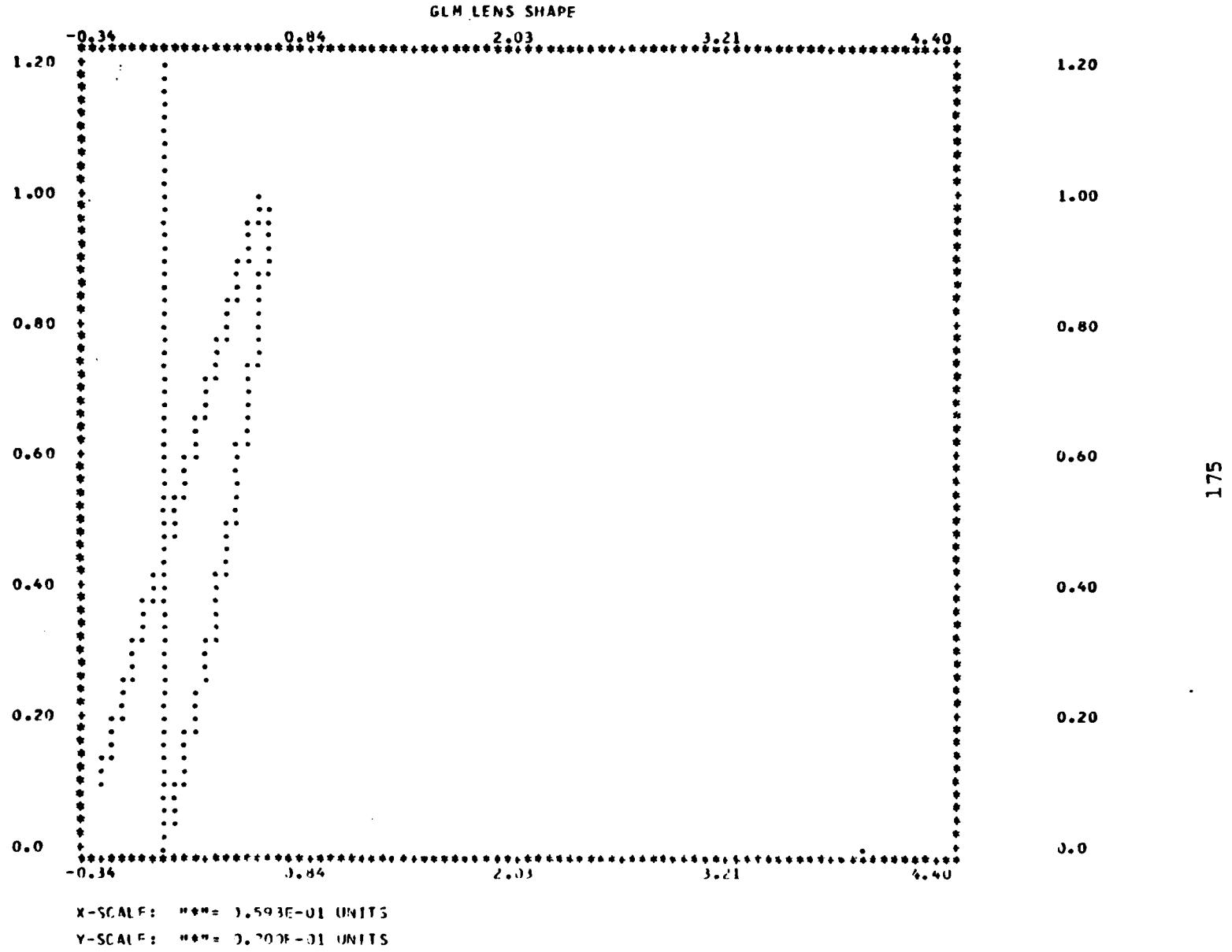
FOCAL LENGTH = 4.0000000 ALPHA = 0.7853979 U = 0.0 I = 1008

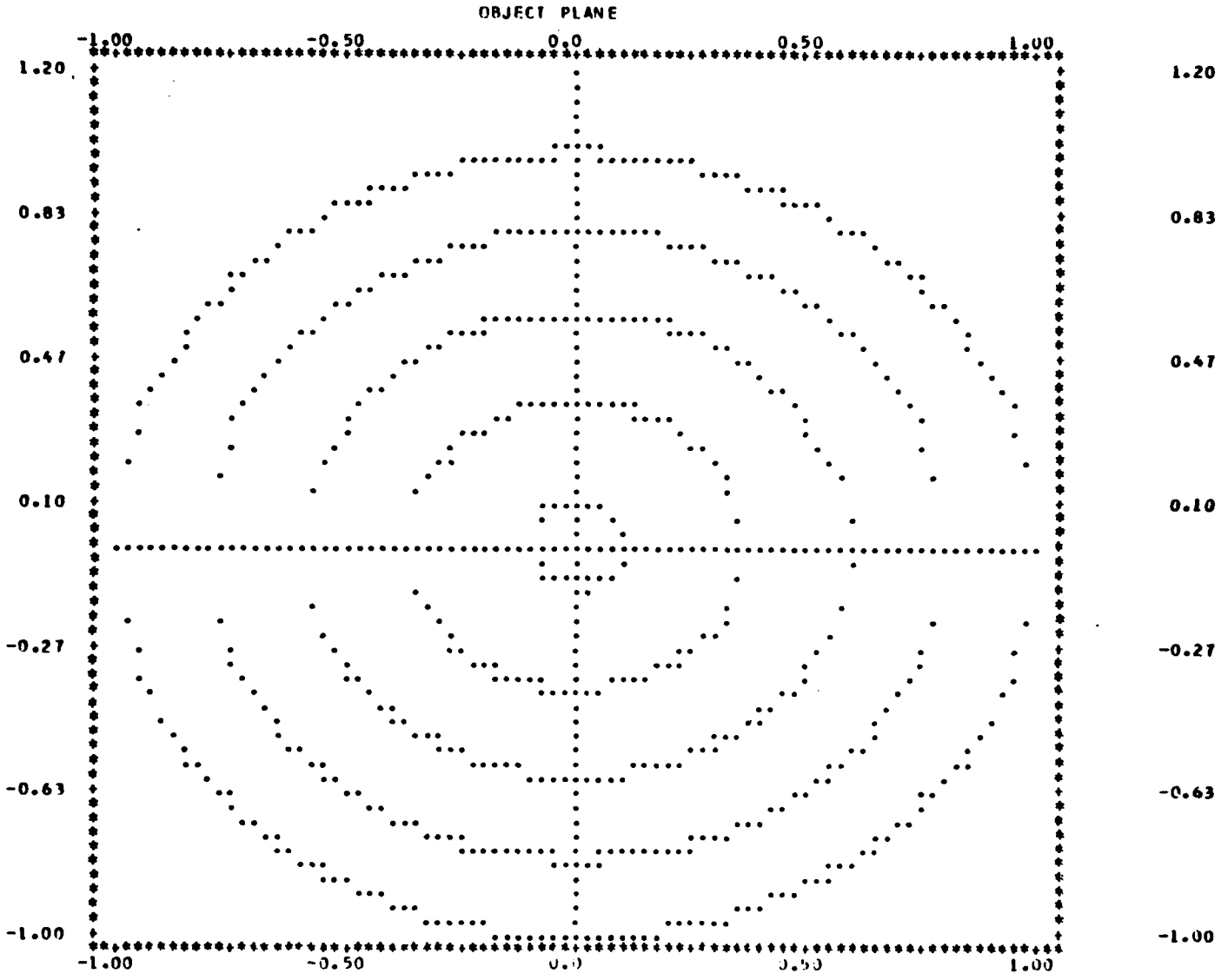
R = 1.0000000 T = 0.0500000 INDICES OF REFRACTION ARE: N1 = 1.0000000 N2 = 1.5757046 N3 = 1.0000000

ALFAP = 0.0 GRID = 0.1000000 STATNA = 0.0 GAMMA = 0.0 XC=-.51737 DIV=0.05000

RAYS = 310 COUNT = 310 YCENTR = 0.0030477 SIGMAY = 0.0000180 SIGMAZ = 0.0000297

RMSRAD = 0.0069021


GLM LENS SHAPE
-0.34
0.84
2.03
3.21
4.40
1.20
1.00
0.80
0.60
0.40
0.20
0.0
X-SCALE: ***= 3.593E-01 UNITS
Y-SCALE: ***= 3.703E-01 UNITS


OBJECT PLANE
-1.00
-0.50
0.0
0.50
1.00
1.20
0.83
0.47
0.10
-0.27
-0.63
-1.00
X-SCALE: "*"= 0.250E-01 UNITS
Y-SCALE: "*"= 0.367E-01 UNITS

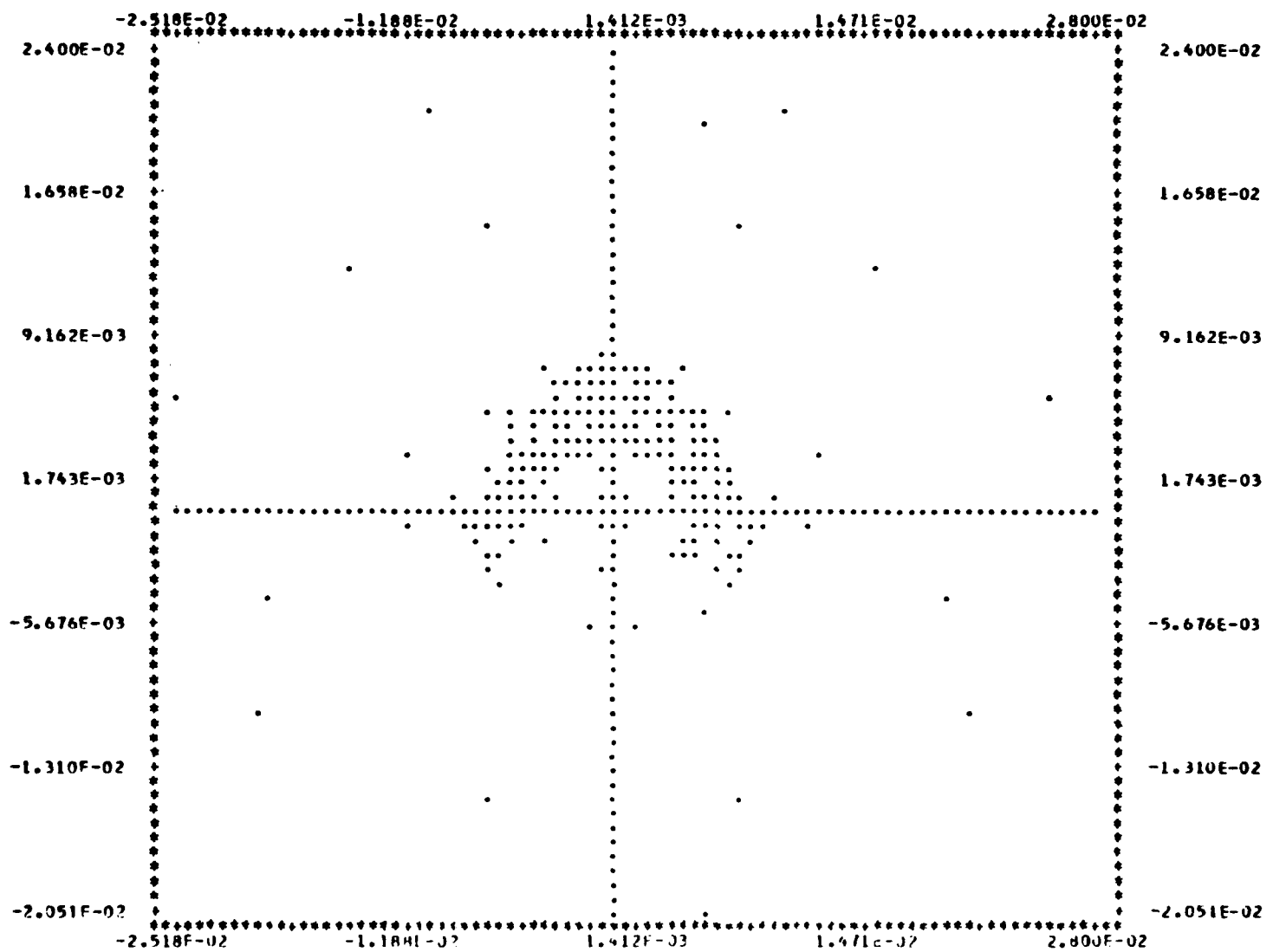
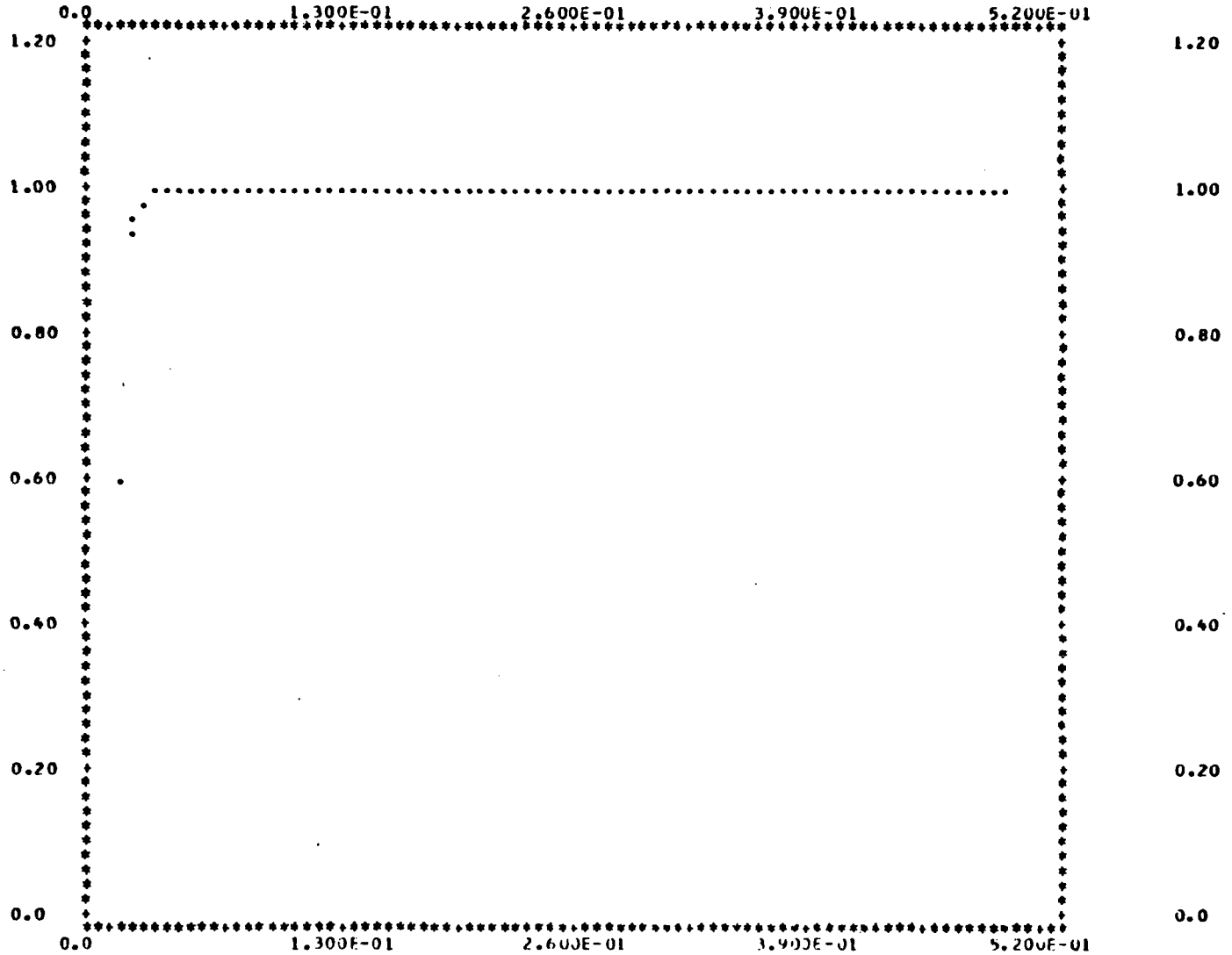


IMAGE PLANE
-2.518E-02
-1.188E-02
1.412E-03
1.471E-02
2.800E-02
2.400E-02
1.658E-02
9.162E-03
1.743E-03
-5.676E-03
-1.310E-02
-2.051E-02
X-SCALE: "*"= 0.665E-03 UNITS
Y-SCALE: "*"= 0.742E-03 UNITS


ENERGY DENSITY VS. RADIUS FROM CENTROID
0.0
1.300E-01
2.600E-01
3.900E-01
5.200E-01
1.20
1.00
0.80
0.60
0.40
0.20
0.0
X-SCALE: "*"= 0.650E-02 UNITS
Y-SCALE: "*"= 0.200E-01 UNITS

SUMMARY OF RESULTS

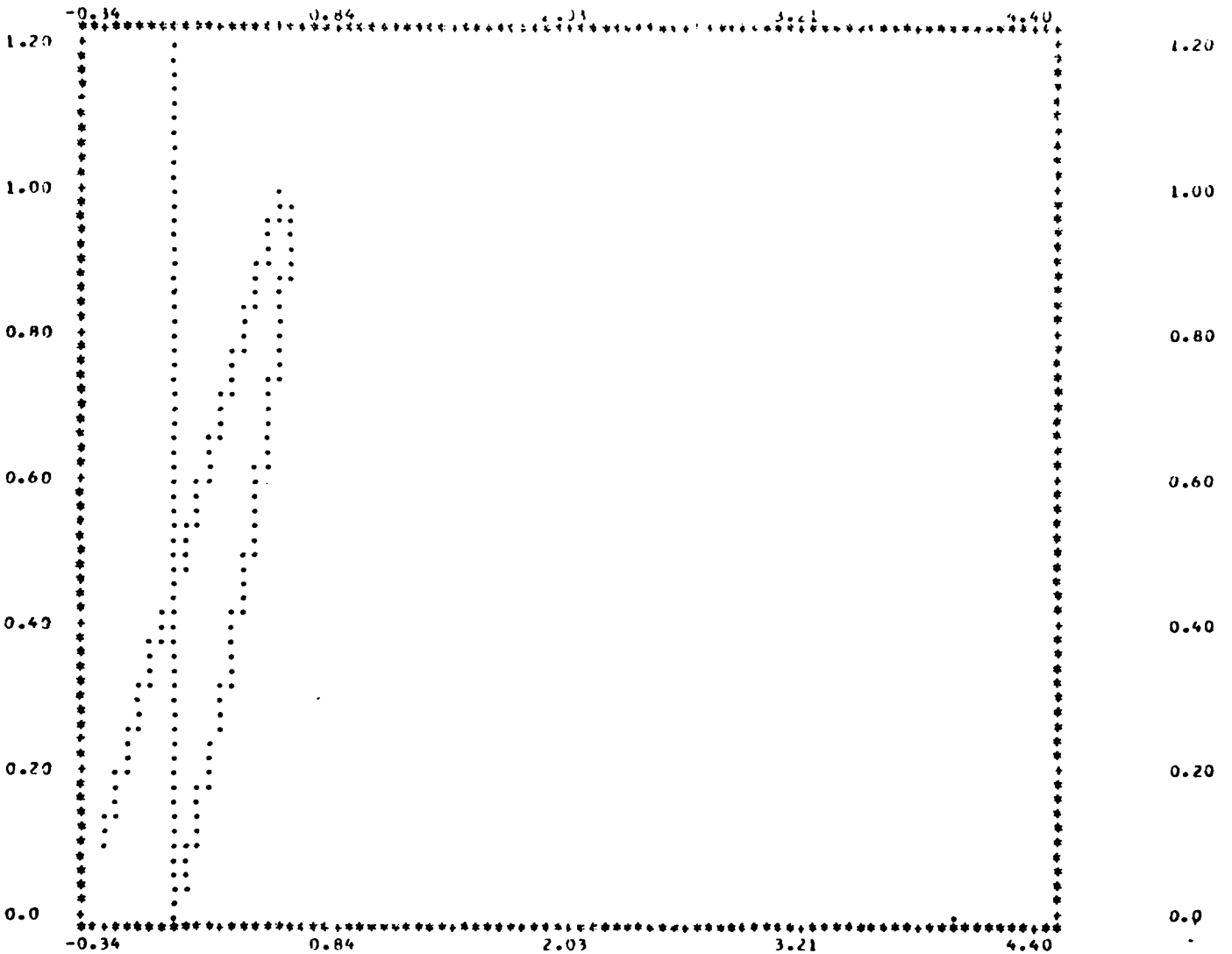
FOCAL LENGTH = 4.0000000 ALPHA = 0.7853979 U = 0.0 I = 1008

R = 1.0000000 T = 0.0500000 INDICES OF REFRACTION ARE: N1 = 1.0000000 N2 = 1.5602507 N3 = 1.0000000

ALFAP = 0.1000000 GRID = 0.1000000 STATMA = 0.0 GAMMA = 0.0 XC=-.51737 DIV=0.05000

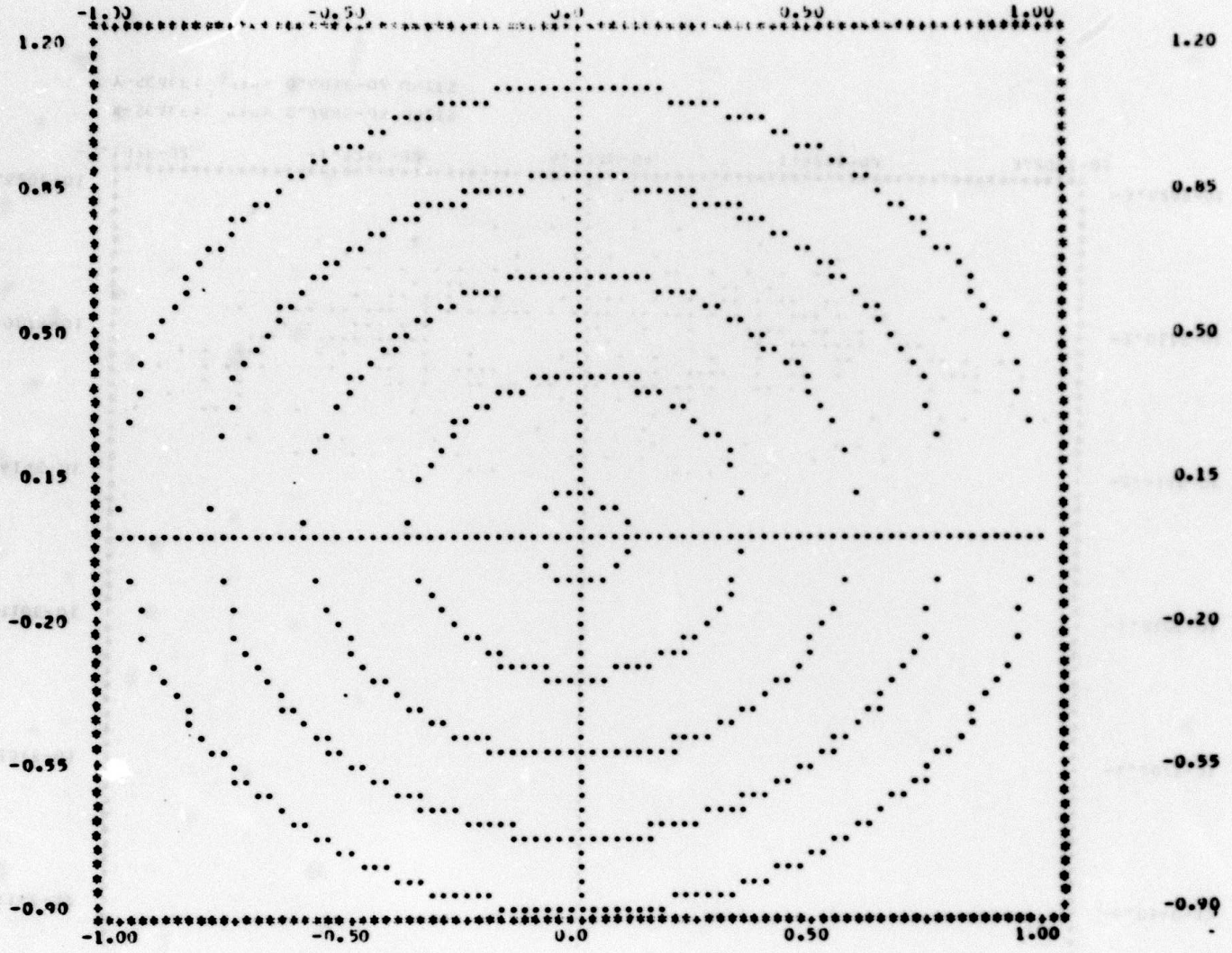
RAYS = 297 COUNT = 284 YCENTR = -0.2932486 SIGMAY = 0.0005434 SIGMAZ = 0.0002209

RMSRAD = 0.0276461




X-SCALE: "*"= 0.593E-01 UNITS

Y-SCALE: "*"= 0.200E-01 UNITS




X-SCALE: "*"= 0.250E-01 UNITS

Y-SCALE: "*"= 0.349E-01 UNITS

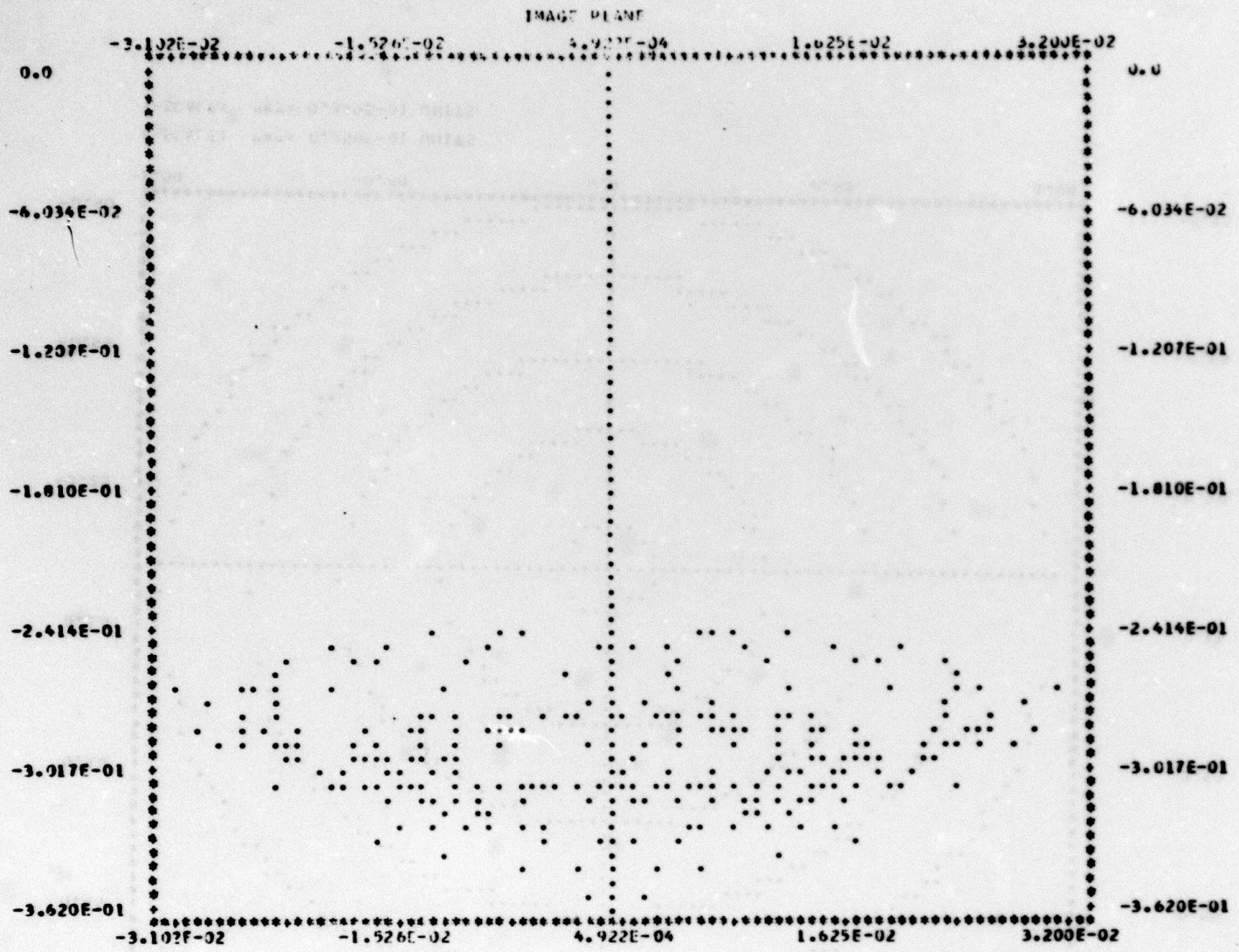
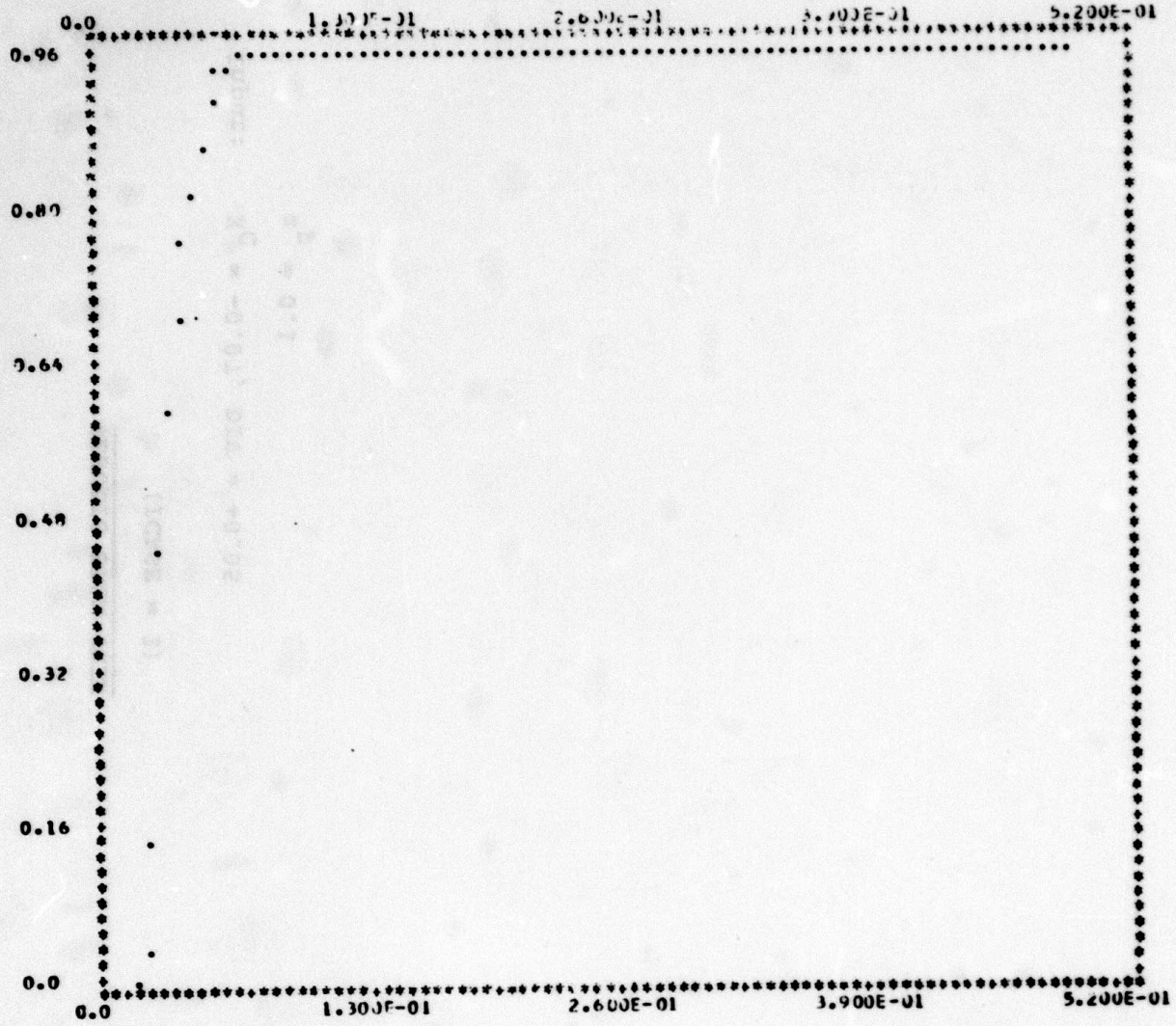


IMAGE PLANE
-3.102E-02
-1.526E-02
4.922E-04
1.625E-02
3.200E-02
0.0
-6.034E-02
-1.207E-01
-1.810E-01
-2.414E-01
-3.017E-01
-3.620E-01
X-SCALE: *** = 0.7805E-03 UNITS
Y-SCALE: *** = 0.6033E-02 UNITS


ENERGY DENSITY VS. RADIUS FROM CENTROID
0.0
1.300E-01
2.600E-01
3.900E-01
5.200E-01
0.96
0.80
0.64
0.48
0.32
0.16
0.0
X-SCALE: "*"= 0.650E-02 UNITS
Y-SCALE: "*"= 0.160E-01 UNITS

## RESULTS FROM GRIN

(ICASE = 2)

Input: $X_c = -0.07$, DIV = +0.05

$\alpha_p = 0.1$

SUMMARY OF RESULTS

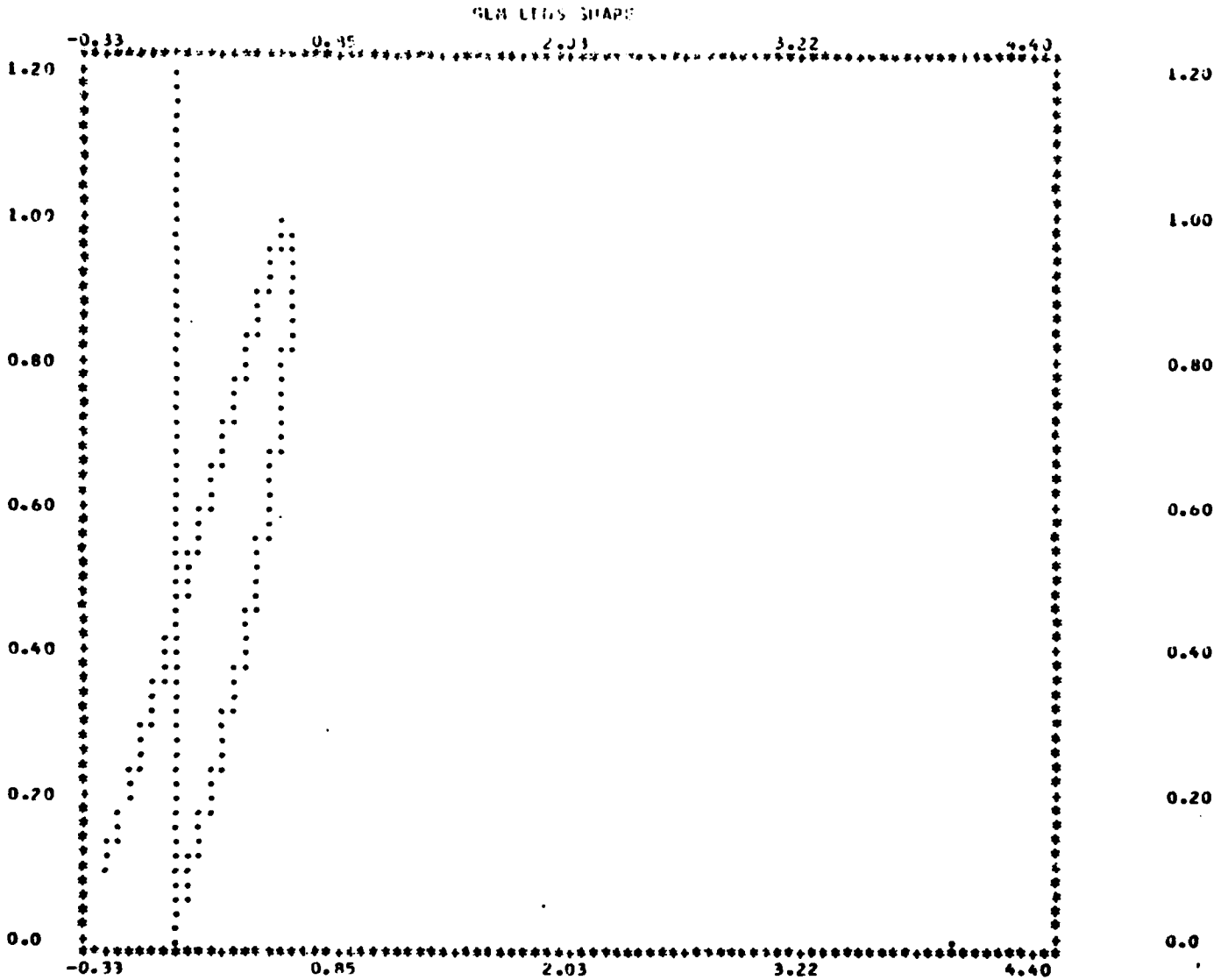
FOCAL LENGTH = 4.0000000 ALPHA = 0.7853979 U = 0.0 I = 1008

R = 1.0000000 T = 0.0500000 INDICES OF REFRACTION ARE N1 = 1.0000000 N2 = 1.4194584 N3 = 1.0000000

ALFAP = 0.1000000 GRID = 0.1000000 STATNA = 0.0 GAMMA = 0.0 XC=-.50618 DIV=-.05000

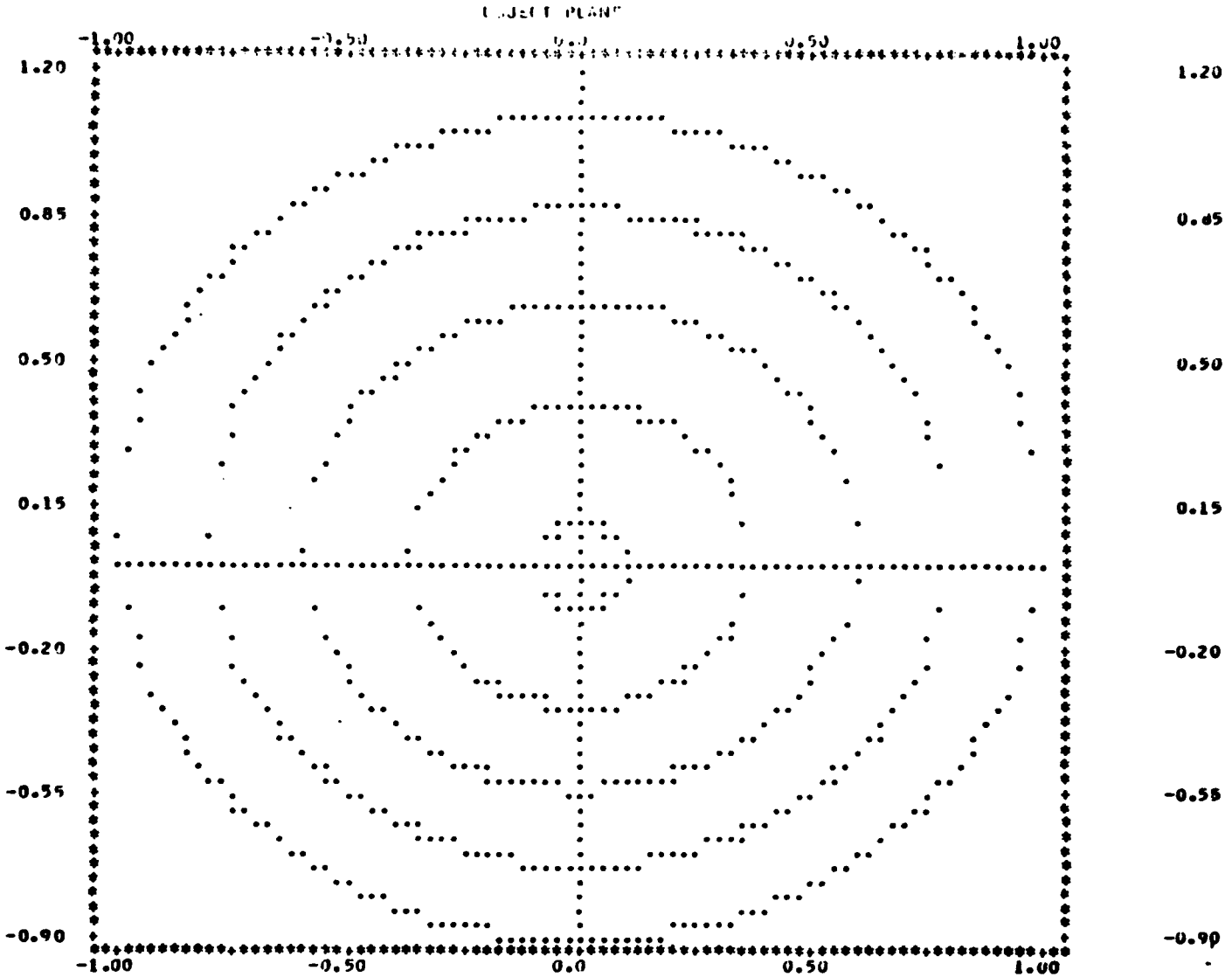
RAYS = 285 COUNT = 284 YCENTR = -0.2919591 SIGMAY = 0.0005272 SIGMAZ = 0.0002196

RMSRAD = 0.0273276




X-SCALE: "**= 0.592E-01 UNITS

Y-SCALE: "**= 0.200E-01 UNITS


OBJECT PLANE
-1.00
-0.50
0.0
0.50
1.00
1.20
0.85
0.50
0.15
-0.20
-0.55
-0.90
X-SCALE: **** 0.250E-01 UNITS
Y-SCALE: **** 0.349E-01 UNITS

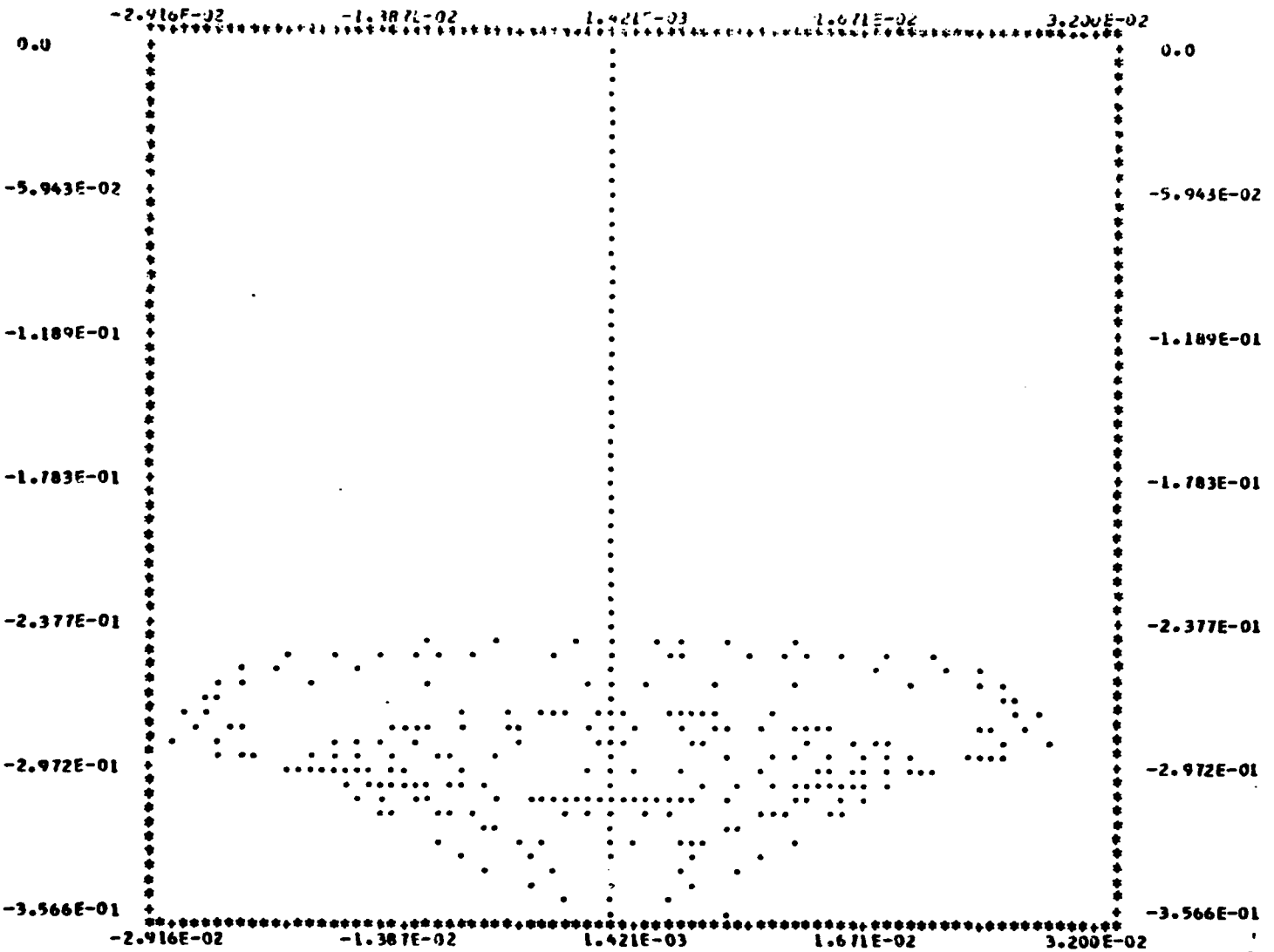
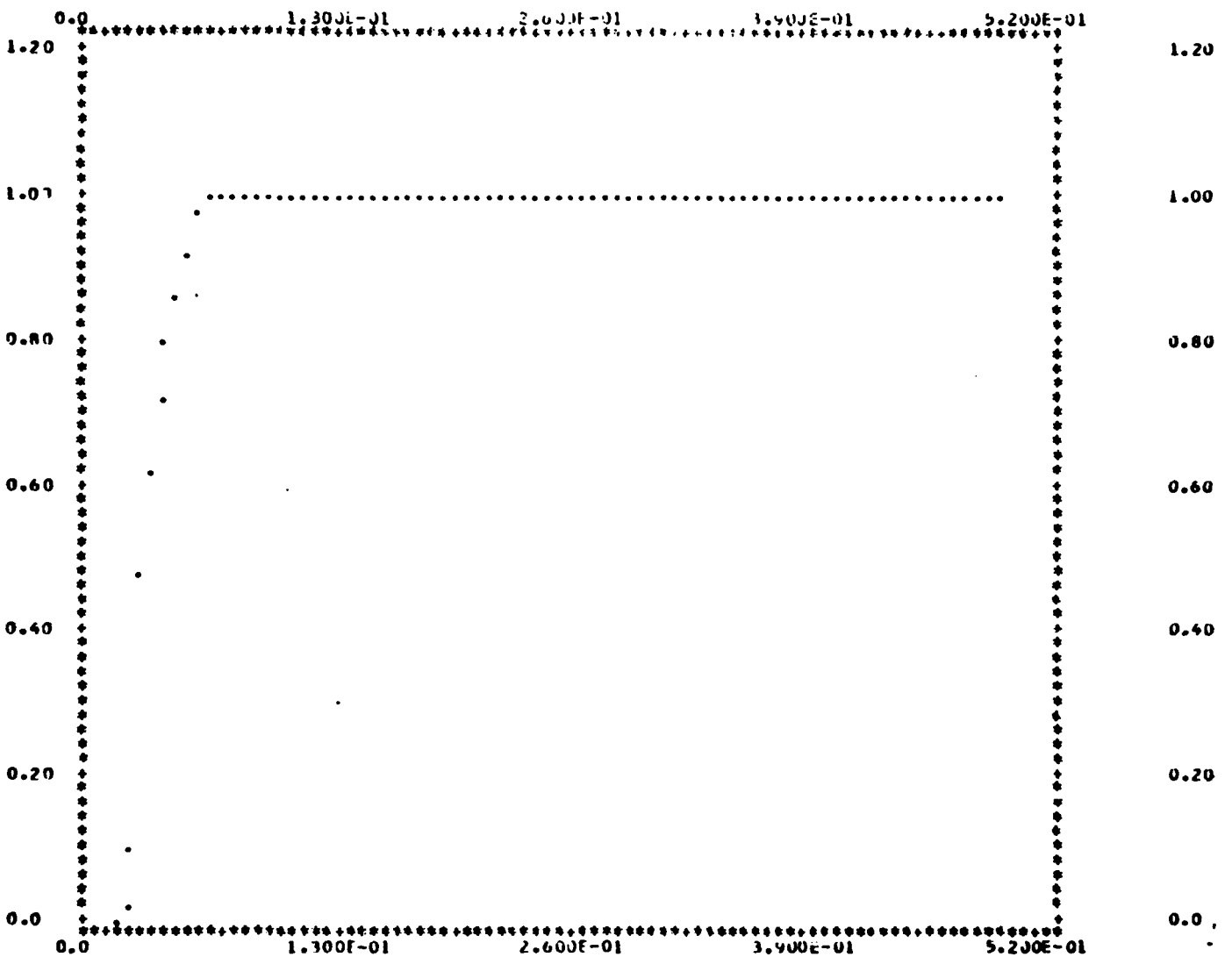


IMAGE PLANE
-2.916E-02
-1.387E-02
1.421E-03
1.671E-02
3.200E-02
0.0
-5.943E-02
-1.189E-01
-1.783E-01
-2.377E-01
-2.972E-01
-3.566E-01
X-SCALE: "*"= 0.764E-03 UNITS
Y-SCALE: "*"= 0.594E-02 UNITS


ENERGY DENSITY VS. RADIUS FROM CENTER (R)
0.0
1.300E-01
2.600E-01
3.900E-01
5.200E-01
1.20
1.00
0.80
0.60
0.40
0.20
0.0
X-SCALE: "*"= 0.650E-02 UNITS
Y-SCALE: "*"= 0.200E-01 UNITS

## RESULTS FROM GRIN

1. Checkup for the homogeneous case.

* GRIN PARAMETERS(2):

ALPHA = 0.7853979 BETA = 0.3222679 RADIUS = 1.00000 INCIDENT ANGLE = 0.0 ITERATIONS = 1000

EDGE THICKNESS = 0.0500000 INDICES OF REFRACTION: N1 = 1.00000 N2 = 1.50000 N3 = 1.00000

FOCAL LENGTH FROM STATION ZERO = 4.00000 DELTA BETA= 0.00032

CENTER OF SYM(XC)=-0.07000 CHANGE IN N2(%)= 0.0 ALFAP= 0.0

NOTE:X-COORDINATES HAS BEEN SHIFTED IN CASE=2 BY X2(K);NOW,X2(K)=0.0 ETC.

| J | X1 | Y1 | X2 | Y2 | BETA | I2P | I2 | ETA | T | I1P | I1 | DYDXT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | E | THETAE | THETA0 | PSI | PSI0 | RR | RF | | | | | |
| | 0.44158 | 0.61444 | 3.55802 | -0.51198 | | | | | | | | |

ISKEW RAY TRACE PARAMETERS:

ALFAP= 0.0 GRID= 0.1000000 SEE LENS PARAMETERS ABOVE.

| RAY | RAYY | RAYZ | XO | YO | XI | YI | ZI | OPL | YIN | ZIN | NTNCTY | XDIAPT | YDIAPT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PHII | PHIIP | CKPP | CLPP | CMPP | D3 | D1 | NUM6 | NUM7 | NUM8 | | | |
| 1 | 0.0 | 0.20000 | -0.24198 | 0.0 | 0.09462 | 0.0 | 0.09789 | 4.24782 | 0.0 | -0.01990 | 1.00000 | -0.143E+00 | 0.0 |
| | 0.4496 | 0.7101 | 0.9994 | 0.0 | -0.0340 | 3.4654 | 0.4420 | 0.2000 | 0.0 | -0.5926 | | | |
| 2 | 0.0 | 0.30000 | -0.14198 | 0.0 | 0.18629 | 0.0 | 0.20042 | 4.18231 | 0.0 | -0.00399 | 1.00000 | 0.376E+00 | 0.0 |
| | 0.4143 | 0.6482 | 0.9982 | 0.0 | -0.0605 | 3.3779 | 0.4420 | 0.3000 | 0.0 | -0.5760 | | | |
| 3 | 0.0 | 0.40000 | -0.04198 | 0.0 | 0.27181 | 0.00122 | 0.30482 | 4.10801 | 0.00574 | -0.00267 | 1.00000 | 0.413E+00 | 0.571E-02 |
| | 0.3668 | 0.5681 | 0.9957 | 0.0014 | -0.0932 | 3.3005 | 0.4420 | 0.4000 | 0.0 | -0.5573 | | | |
| 4 | 0.0 | 0.50000 | 0.05802 | 0.0 | 0.35019 | 0.00091 | 0.41138 | 4.02959 | 0.00312 | -0.00140 | 1.00000 | 0.431E+00 | 0.312E-02 |
| | 0.3121 | 0.4786 | 0.9918 | 0.0007 | -0.1276 | 3.2343 | 0.4420 | 0.5000 | 0.0 | -0.5399 | | | |
| 5 | 0.0 | 0.60000 | 0.15802 | 0.0 | 0.42091 | 0.00138 | 0.52326 | 3.94930 | 0.00367 | -0.00220 | 1.00000 | 0.429E+00 | 0.366E-02 |
| | 0.2487 | 0.3782 | 0.9864 | 0.0007 | -0.1643 | 3.1813 | 0.4420 | 0.6000 | 0.0 | -0.5245 | | | |
| 6 | 0.0 | 0.70000 | 0.25802 | 0.0 | 0.48317 | 0.00226 | 0.63176 | 3.86772 | 0.00490 | -0.00325 | 1.00000 | 0.441E+00 | 0.490E-02 |
| | 0.1799 | 0.2717 | 0.9795 | 0.0008 | -0.2013 | 3.1391 | 0.4420 | 0.7000 | 0.0 | -0.5125 | | | |
| 7 | 0.0 | 0.80000 | 0.35802 | 0.0 | 0.53638 | 0.00285 | 0.74599 | 3.78667 | 0.00516 | -0.00307 | 1.00000 | 0.430E+00 | 0.515E-02 |
| | 0.1024 | 0.1540 | 0.9706 | 0.0007 | -0.2406 | 3.1131 | 0.4420 | 0.8000 | 0.0 | -0.5040 | | | |
| 8 | 0.0 | 0.90000 | 0.45802 | 0.0 | 0.59029 | 0.00411 | 0.86291 | 3.70409 | 0.00643 | -0.00398 | 1.00000 | 0.439E+00 | 0.643E-02 |
| | 0.0244 | 0.0365 | 0.9604 | 0.0007 | -0.2786 | 3.1005 | 0.4420 | 0.9000 | 0.0 | -0.5002 | | | |
| 9 | 0.10000 | 0.10000 | -0.30256 | 0.10000 | 0.33821 | 0.02734 | 0.02734 | 4.27621 | -0.01341 | -0.01343 | 1.00000 | -0.718E+00 | 0.129E-04 |
| | 0.4716 | 0.7497 | 0.9959 | -0.0116 | -0.0116 | 3.5203 | 0.4420 | 0.1414 | 0.1000 | -0.6044 | | | |
| 10 | 0.10000 | 0.21000 | -0.21837 | 0.10000 | 0.11679 | 0.05453 | 0.11936 | 4.23378 | -0.00747 | -0.01495 | 1.00000 | 0.271E-01 | 0.238E-05 |
| | 0.4415 | 0.6958 | 0.9952 | -0.0180 | -0.0369 | 3.4440 | 0.4420 | 0.2236 | 0.1000 | -0.5886 | | | |
| 11 | 0.10000 | 0.30000 | -0.12575 | 0.10000 | 0.20656 | 0.06914 | 0.20654 | 4.17058 | 0.00061 | -0.00819 | 1.00000 | 0.314E+00 | 0.322E-02 |
| | 0.4055 | 0.6331 | 0.9938 | -0.0204 | -0.0536 | 3.3649 | 0.4420 | 0.3162 | 0.1000 | -0.5722 | | | |
| 12 | 0.10000 | 0.40000 | -0.02967 | 0.10000 | 0.28181 | 0.07762 | 0.30820 | 4.09841 | 0.00212 | -0.00178 | 1.00000 | 0.423E+00 | 0.255E-02 |
| | 0.3611 | 0.5585 | 0.9953 | -0.0229 | -0.0942 | 3.2917 | 0.4420 | 0.4123 | 0.1000 | -0.5552 | | | |
| 13 | 0.10000 | 0.50000 | 0.06792 | 0.10000 | 0.35757 | 0.08399 | 0.41361 | 4.02145 | 0.00404 | -0.00695 | 1.00000 | 0.435E+00 | 0.423E-02 |
| | 0.3068 | 0.4702 | 0.9914 | -0.0248 | -0.1284 | 3.2282 | 0.4420 | 0.5099 | 0.1000 | -0.5385 | | | |
| 14 | 0.10000 | 0.60000 | 0.16630 | 0.10000 | 0.42646 | 0.08966 | 0.52172 | 3.94261 | 0.00652 | -0.00324 | 1.00000 | 0.423E+00 | 0.704E-02 |
| | 0.2433 | 0.3697 | 0.9859 | -0.0262 | -0.1653 | 3.1763 | 0.4420 | 0.6083 | 0.1000 | -0.5234 | | | |
| 15 | 0.10000 | 0.70000 | 0.26513 | 0.10000 | 0.48736 | 0.09275 | 0.63297 | 3.86242 | 0.00445 | -0.00324 | 1.00000 | 0.426E+00 | 0.494E-02 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.1733 | C.2616 | 0.9788 | -0.0281 | -0.2028 | 3.1372 | 0.4420 | 0.7071 | 0.1000 | -0.5116 | | | | |
| 16 | 0.10000 | 0.80000 | 0.36424 | 0.10000 | 0.53541 | 0.09649 | 0.74689 | 3.78137 | 0.00526 | -0.00283 | 1.00000 | 0.431E+00 | 0.561E-02 | |
| | 0.0981 | 0.1475 | 0.9701 | -0.0253 | -0.2409 | 3.1117 | 0.4420 | 0.8062 | 0.1000 | -0.5036 | | | | |
| 17 | 0.10000 | 0.90000 | 0.46356 | 0.10000 | 0.58247 | 0.09989 | 0.86372 | 3.69886 | 0.00617 | 0.00074 | 1.00000 | 0.445E+00 | 0.609E-02 | |
| | 0.0214 | 0.0320 | 0.9600 | -0.0302 | -0.2784 | 3.0996 | 0.4420 | 0.9055 | 0.1000 | -0.5002 | | | | |
| 18 | 0.20000 | 0.0 | -0.24198 | 0.20000 | 0.09460 | 0.09790 | 0.0 | 4.24767 | -0.01658 | 0.0 | 1.00000 | 0.100E+06 | 0.100E+06 | |
| | 0.4508 | 0.7123 | 0.9955 | -0.0330 | 0.0 | 3.4653 | 0.4420 | 0.2000 | 0.2000 | -0.5933 | | | | |
| 19 | 0.20000 | 0.10000 | -0.21837 | 0.20000 | 0.11676 | 0.10907 | 0.05454 | 4.23355 | -0.00967 | -0.00484 | 1.00000 | 0.162E+00 | 0.296E-05 | |
| | 0.4437 | 0.6997 | 0.9993 | -0.0345 | -0.0172 | 3.4438 | 0.4420 | 0.2236 | 0.2000 | -0.5897 | | | | |
| 20 | 0.20000 | 0.20000 | -0.15514 | 0.20000 | 0.17099 | 0.12954 | 0.12885 | 4.19425 | 0.00145 | -0.00408 | 1.00000 | 0.338E+00 | 0.542E-02 | |
| | 0.4227 | 0.6628 | 0.9985 | -0.0377 | -0.0352 | 3.3921 | 0.4420 | 0.2828 | 0.2000 | -0.5797 | | | | |
| 21 | 0.20000 | 0.30000 | -0.08143 | 0.20000 | 0.23886 | 0.14644 | 0.21894 | 4.13809 | -0.00332 | -0.00447 | 1.00000 | 0.376E+00 | 0.262E-02 | |
| | 0.3861 | 0.6002 | 0.9968 | -0.0441 | -0.0671 | 3.3299 | 0.4420 | 0.3606 | 0.2000 | -0.5644 | | | | |
| 22 | 0.20000 | 0.40000 | 0.00523 | 0.20000 | 0.30970 | 0.15988 | 0.31681 | 4.07126 | 0.00421 | -0.00380 | 1.00000 | 0.403E+00 | 0.586E-02 | |
| | 0.3421 | 0.5273 | 0.9940 | -0.0477 | -0.0981 | 3.2678 | 0.4420 | 0.4472 | 0.2000 | -0.5489 | | | | |
| 23 | 0.20000 | 0.50000 | 0.09654 | 0.20000 | 0.37842 | 0.16964 | 0.42016 | 3.99871 | 0.00381 | -0.00292 | 1.00000 | 0.420E+00 | 0.496E-02 | |
| | 0.2888 | 0.4414 | 0.9869 | -0.0516 | -0.1317 | 3.2119 | 0.4420 | 0.5385 | 0.2000 | -0.5337 | | | | |
| 24 | 0.20000 | 0.60000 | 0.19047 | 0.20000 | 0.44295 | 0.17763 | 0.52702 | 3.92263 | 0.00441 | -0.00136 | 1.00000 | 0.434E+00 | 0.486E-02 | |
| | 0.2280 | 0.3469 | 0.9844 | -0.0547 | -0.1669 | 3.1652 | 0.4420 | 0.6325 | 0.2000 | -0.5204 | | | | |
| 25 | 0.20000 | 0.70000 | 0.28603 | 0.20000 | 0.49904 | 0.18458 | 0.63721 | 3.84469 | 0.00495 | -0.00071 | 1.00000 | 0.439E+00 | 0.519E-02 | |
| | 0.1597 | 0.2409 | 0.9773 | -0.0574 | -0.2038 | 3.1299 | 0.4420 | 0.7280 | 0.2000 | -0.5098 | | | | |
| 26 | 0.20000 | 0.80000 | 0.38264 | 0.20000 | 0.54807 | 0.19129 | 0.75245 | 3.76594 | 0.00585 | -0.00223 | 1.00000 | 0.433E+00 | 0.640E-02 | |
| | 0.0845 | 0.1270 | 0.9684 | -0.0597 | -0.2422 | 3.1082 | 0.4420 | 0.8246 | 0.2000 | -0.5027 | | | | |
| 27 | 0.20000 | 0.90000 | 0.47997 | 0.20000 | 0.58862 | 0.19555 | 0.86723 | 3.68655 | 0.00346 | -0.00374 | 1.00000 | 0.429E+00 | 0.428E-02 | |
| | 0.0055 | 0.0083 | 0.9577 | -0.0620 | -0.2809 | 3.1005 | 0.4420 | 0.9220 | 0.2000 | -0.5000 | | | | |
| 28 | 0.30000 | 0.0 | -0.14198 | 0.30000 | 0.18629 | 0.20743 | 0.00938 | 4.18233 | -0.00439 | 0.00279 | 1.00000 | -0.346E+01 | 0.233E+00 | |
| | 0.4141 | 0.6480 | 0.9982 | -0.0606 | 0.0007 | 3.3779 | 0.4420 | 0.3000 | 0.3000 | -0.5759 | | | | |
| 29 | 0.30000 | 0.10000 | -0.12575 | 0.30000 | 0.20059 | 0.20619 | 0.08840 | 4.17098 | -0.00654 | -0.00437 | 1.00000 | 0.241E+00 | 0.622E-02 | |
| | 0.4054 | 0.6331 | 0.9979 | -0.0632 | -0.0216 | 3.3649 | 0.4420 | 0.3162 | 0.3000 | -0.5722 | | | | |
| 30 | 0.30000 | 0.20000 | -0.08143 | 0.30000 | 0.23886 | 0.21941 | 0.14574 | 4.13809 | -0.00187 | -0.00421 | 1.00000 | 0.349E+00 | 0.434E-02 | |
| | 0.3861 | 0.6002 | 0.9968 | -0.0665 | -0.0450 | 3.3299 | 0.4420 | 0.3606 | 0.3000 | -0.5644 | | | | |
| 31 | 0.30000 | 0.30000 | -0.01772 | 0.30000 | 0.29149 | 0.23426 | 0.23309 | 4.08932 | 0.00143 | -0.00463 | 1.00000 | 0.378E+00 | 0.498E-02 | |
| | 0.3539 | 0.5467 | 0.9948 | -0.0712 | -0.0724 | 3.2835 | 0.4420 | 0.4243 | 0.3000 | -0.5528 | | | | |
| 32 | 0.30000 | 0.40000 | 0.05802 | 0.30000 | 0.35019 | 0.24772 | 0.32843 | 4.02951 | 0.00223 | -0.00342 | 1.00000 | 0.409E+00 | 0.476E-02 | |
| | 0.3121 | 0.4786 | 0.9918 | -0.0759 | -0.1026 | 3.2343 | 0.4420 | 0.5000 | 0.3000 | -0.5399 | | | | |
| 33 | 0.30000 | 0.50000 | 0.14111 | 0.30000 | 0.40954 | 0.25944 | 0.42938 | 3.96288 | 0.00287 | -0.00356 | 1.00000 | 0.416E+00 | 0.498E-02 | |
| | 0.2602 | 0.3963 | 0.9875 | -0.0805 | -0.1359 | 3.1884 | 0.4420 | 0.5831 | 0.3000 | -0.5270 | | | | |
| 34 | 0.30000 | 0.60000 | 0.22884 | 0.30000 | 0.46587 | 0.26969 | 0.53477 | 3.89188 | 0.00322 | -0.00409 | 1.00000 | 0.418E+00 | 0.524E-02 | |
| | 0.1998 | 0.3023 | 0.9816 | -0.0846 | -0.1711 | 3.1500 | 0.4420 | 0.6708 | 0.3000 | -0.5155 | | | | |
| 35 | 0.30000 | 0.70000 | 0.31560 | 0.30000 | 0.51702 | 0.27949 | 0.64364 | 3.81779 | 0.00526 | -0.00418 | 1.00000 | 0.422E+00 | 0.703E-02 | |
| | 0.1329 | 0.2001 | 0.9743 | -0.0879 | -0.2075 | 3.1213 | 0.4420 | 0.7616 | 0.3000 | -0.5067 | | | | |
| 36 | 0.30000 | 0.80000 | 0.41242 | 0.30000 | 0.56145 | 0.28619 | 0.75690 | 3.74141 | 0.00333 | -0.00160 | 1.00000 | 0.436E+00 | 0.393E-02 | |
| | 0.0612 | 0.0919 | 0.9654 | -0.0911 | -0.2444 | 3.1040 | 0.4420 | 0.8544 | 0.3000 | -0.5014 | | | | |
| 37 | 0.30000 | 0.90000 | 0.50670 | 0.30000 | 0.59878 | 0.29381 | 0.87285 | 3.66484 | 0.00246 | -0.00512 | 1.00000 | 0.425E+00 | 0.415E-02 | |
| | 0.0168 | 0.0252 | 0.9545 | -0.0939 | -0.2831 | 3.1011 | 0.4420 | 0.9487 | 0.3000 | -0.5001 | | | | |
| 38 | 0.40000 | 0.0 | -0.04198 | 0.40000 | 0.27180 | 0.30482 | 0.00960 | 4.12802 | -0.00266 | 0.00281 | 1.00000 | -0.373E+01 | 0.388E+00 | |
| | 0.2668 | 0.5681 | 0.9957 | -0.0932 | 0.0007 | 3.3006 | 0.4420 | 0.4000 | 0.4000 | -0.5573 | | | | |
| 39 | 0.40000 | 0.10000 | -0.02967 | 0.40000 | 0.28182 | 0.31066 | 0.07578 | 4.09841 | 0.00329 | -0.00618 | 1.00000 | 0.195E+00 | 0.235E-01 | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.3611 | C.5585 | C.9953 | -0.0937 | -0.0249 | 3.2917 | 0.4420 | 0.4123 | 0.4000 | -0.5552 | | | |
| 40 | 0.40000 | C.20000 | 0.00523 | 0.40000 | 0.30970 | 0.31802 | 0.15747 | 4.07126 | 0.00104 | -0.00566 | 1.00000 | 0.329E+00 | C.120E-01 |
| | 0.3421 | 0.5273 | 0.9540 | -0.0970 | -0.0499 | 3.2678 | 0.4420 | 0.4472 | 0.4000 | -0.5489 | | | |
| 41 | 0.40000 | C.30000 | 0.05802 | 0.40000 | 0.35020 | 0.32981 | 0.24587 | 4.02951 | 0.00132 | -0.00405 | 1.00000 | 0.390E+00 | C.670E-02 |
| | 0.3121 | 0.4786 | C.9918 | -0.1016 | -0.0773 | 3.2343 | 0.4420 | 0.5000 | 0.4000 | -0.5399 | | | |
| 42 | 0.40000 | C.40000 | 0.12370 | 0.40000 | 0.39759 | 0.34226 | 0.34025 | 3.97660 | 0.00327 | -0.00254 | 1.00000 | 0.419E+00 | C.578E-02 |
| | 0.2726 | 0.4158 | C.9886 | -0.1060 | -0.1072 | 3.1979 | 0.4420 | 0.5657 | 0.4000 | -0.5298 | | | |
| 43 | 0.40000 | C.50000 | 0.19833 | 0.40000 | 0.44706 | 0.35438 | 0.43988 | 3.91658 | 0.00257 | -0.00433 | 1.00000 | 0.412E+00 | C.600E-02 |
| | 0.2216 | 0.3359 | C.9838 | -0.1113 | -0.1405 | 3.1621 | 0.4420 | 0.6403 | 0.4000 | -0.5192 | | | |
| 44 | 0.40000 | C.60000 | 0.27913 | 0.40000 | 0.49516 | 0.36580 | 0.54404 | 3.85082 | 0.00351 | -0.00442 | 1.00000 | 0.417E+00 | C.643E-02 |
| | 0.1634 | C.2466 | 0.9777 | -0.1157 | -0.1751 | 3.1326 | 0.4420 | 0.7211 | 0.4000 | -0.5103 | | | |
| 45 | 0.40000 | C.70000 | 0.36424 | 0.40000 | 0.53940 | 0.37505 | 0.65306 | 3.78137 | 0.00147 | -0.00332 | 1.00000 | 0.427E+00 | C.336E-02 |
| | 0.0981 | C.1475 | 0.9701 | -0.1201 | -0.2109 | 3.1117 | 0.4420 | 0.8062 | 0.4000 | -0.5036 | | | |
| 46 | 0.40000 | C.80000 | 0.45245 | 0.40000 | 0.57806 | 0.38545 | 0.76468 | 3.70887 | 0.00315 | -0.00348 | 1.00000 | 0.428E+00 | 0.489E-02 |
| | 0.0283 | 0.0425 | C.9610 | -0.1233 | -0.2477 | 3.1010 | 0.4420 | 0.8944 | 0.4000 | -0.5003 | | | |
| 47 | 0.40000 | C.90000 | 0.54290 | 0.40000 | 0.60588 | 0.39493 | 0.88002 | 3.63514 | 0.00245 | -0.00638 | 1.00000 | 0.421E+00 | C.531E-02 |
| | 0.0463 | 0.0694 | 0.9560 | -0.1265 | -0.2856 | 3.1034 | 0.4420 | 0.9849 | 0.4000 | -0.5008 | | | |
| 48 | 0.50000 | C.0 | 0.05802 | 0.50000 | 0.35020 | 0.41137 | 0.00139 | 4.02951 | -0.00140 | 0.00472 | 1.00000 | -0.405E+01 | C.582E+00 |
| | 0.3121 | C.4786 | 0.9918 | -0.1276 | 0.0010 | 3.2343 | 0.4420 | 0.5000 | 0.5000 | -0.5399 | | | |
| 49 | C.50000 | C.10000 | C.06792 | 0.50000 | 0.35757 | 0.41411 | 0.18146 | 4.02145 | 0.00173 | -0.00438 | 1.00000 | 0.275E+00 | C.218E-01 |
| | 0.3068 | C.4702 | 0.9914 | -0.1281 | -0.0264 | 3.2282 | 0.4420 | 0.5099 | 0.5000 | -0.5385 | | | |
| 50 | C.50000 | C.20000 | 0.09654 | 0.50000 | 0.37842 | 0.42140 | 0.36628 | 3.99871 | 0.00122 | -0.00654 | 1.00000 | 0.322E+00 | C.171E-01 |
| | 0.2888 | C.4414 | 0.9859 | -0.1308 | -0.0538 | 3.2119 | 0.4420 | 0.5385 | 0.5000 | -0.5337 | | | |
| 51 | 0.50000 | C.30000 | 0.14111 | 0.50000 | 0.40955 | 0.43095 | 0.25682 | 3.96287 | 0.00080 | -0.00437 | 1.00000 | 0.389E+00 | C.801E-02 |
| | 0.2642 | 0.3963 | 0.9875 | -0.1349 | -0.0819 | 3.1894 | 0.4420 | 0.5831 | 0.5000 | -0.5270 | | | |
| 52 | 0.50000 | C.40000 | C.19833 | 0.50000 | 0.44706 | 0.44229 | 0.35136 | 3.91659 | 0.00155 | -0.00477 | 1.00000 | 0.400E+00 | C.745E-02 |
| | 0.2216 | C.3359 | C.9838 | -0.1394 | -0.1126 | 3.1621 | 0.4420 | 0.6403 | 0.5000 | -0.5192 | | | |
| 53 | C.50000 | C.50000 | C.26513 | 0.50000 | 0.48726 | 0.45430 | 0.45141 | 3.86242 | 0.00231 | -0.00556 | 1.00000 | 0.402E+00 | C.822E-02 |
| | 0.1733 | 0.2616 | C.9788 | -0.1441 | -0.1455 | 3.1372 | 0.4420 | 0.7071 | 0.5000 | -0.5116 | | | |
| 54 | C.50000 | C.60000 | C.33904 | 0.50000 | 0.52699 | 0.46495 | 0.55500 | 3.80144 | 0.00284 | -0.00211 | 1.00000 | 0.431E+00 | 0.459E-02 |
| | 0.1191 | C.1792 | C.9727 | -0.1483 | -0.1788 | 3.1163 | 0.4420 | 0.7810 | 0.5000 | -0.5054 | | | |
| 55 | C.50000 | C.70000 | 0.41825 | 0.50000 | 0.56400 | 0.47631 | 0.66259 | 3.73714 | 0.00200 | -0.00421 | 1.00000 | 0.423E+00 | C.500E-02 |
| | 0.0554 | C.0831 | 0.9646 | -0.1528 | -0.2148 | 3.1038 | 0.4420 | 0.8602 | 0.5000 | -0.5012 | | | |
| 56 | C.50000 | C.80000 | 0.50142 | 0.50000 | 0.59631 | 0.48745 | 0.77390 | 3.66936 | 0.00334 | -0.00352 | 1.00000 | 0.425E+00 | C.553E-02 |
| | 0.0198 | C.0162 | 0.9554 | -0.1562 | -0.2508 | 3.1001 | 0.4420 | 0.9434 | 0.5000 | -0.5000 | | | |
| 57 | 0.60000 | 0.0 | 0.15802 | 0.60000 | 0.42091 | 0.52026 | 0.00221 | 3.94931 | -0.00219 | 0.00588 | 1.00000 | -0.456E+01 | C.835E+00 |
| | 0.2487 | C.3782 | 0.9864 | -0.1643 | 0.0012 | 3.1803 | 0.4420 | 0.6000 | 0.6000 | -0.5245 | | | |
| 58 | 0.60000 | C.10000 | 0.16630 | 0.60000 | 0.42645 | 0.52216 | 0.08715 | 3.94261 | -0.00205 | -0.00029 | 1.00000 | 0.432E+00 | -C.358E-03 |
| | 0.2433 | C.3696 | 0.9859 | -0.1650 | -0.0279 | 3.1763 | 0.4420 | 0.6083 | 0.6000 | -0.5234 | | | |
| 59 | 0.60000 | C.20000 | 0.19047 | 0.60000 | 0.44206 | 0.52839 | 0.17352 | 3.92267 | 0.00204 | -0.00578 | 1.00000 | 0.341E+00 | C.190E-01 |
| | 0.2289 | C.3460 | 0.9844 | -0.1663 | -0.0566 | 3.1652 | 0.4420 | 0.6325 | 0.6000 | -0.5204 | | | |
| 60 | 0.60000 | 0.30000 | 0.22884 | 0.60000 | 0.46588 | 0.53694 | 0.26534 | 3.89188 | 0.00187 | -0.00672 | 1.00000 | 0.366E+00 | C.141E-01 |
| | 0.1998 | C.3023 | 0.9816 | -0.1702 | -0.0864 | 3.1509 | 0.4420 | 0.6708 | 0.6000 | -0.5155 | | | |
| 61 | 0.60000 | C.40000 | 0.27513 | 0.60000 | 0.49515 | 0.54647 | 0.36216 | 3.85083 | 0.00363 | -0.00407 | 1.00000 | 0.408E+00 | 0.669E-02 |
| | 0.1634 | C.2465 | 0.9777 | -0.1742 | -0.1169 | 3.1326 | 0.4420 | 0.7211 | 0.6000 | -0.5103 | | | |
| 62 | 0.60000 | C.51000 | 0.33514 | 0.60000 | 0.52699 | 0.55747 | 0.46198 | 3.80144 | 0.00252 | -0.00272 | 1.00000 | 0.424E+00 | C.577E-02 |
| | 0.1191 | C.1792 | C.9727 | -0.1781 | -0.1491 | 3.1163 | 0.4420 | 0.7810 | 0.6000 | -0.5054 | | | |
| 63 | 0.60000 | C.60000 | C.40655 | 0.60000 | 0.55899 | 0.56894 | 0.56570 | 3.74619 | 0.00261 | -0.00284 | 1.00000 | 0.427E+00 | C.545E-02 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.0660 | 0.0990 | 0.9660 | -0.1824 | -0.1831 | 3.1046 | 0.4420 | 0.8485 | 0.6000 | -0.5016 | | | |
| 64 | 0.60000 | C.70000 | 0.47997 | 0.60000 | 0.58863 | 0.58170 | 0.67287 | 3.68655 | 0.00183 | -0.00538 | 1.00000 | 0.41E+00 | C.643E-02 |
| | 0.0055 | C.0083 | C.9577 | -0.1868 | -0.2188 | 3.1004 | 0.4420 | 0.9220 | 0.6000 | -0.5000 | | | |
| 65 | C.60000 | C.80000 | 0.55802 | 0.60000 | 0.61444 | 0.58974 | 0.78631 | 3.62175 | -0.00123 | -0.00165 | 1.00000 | 0.436E+00 | C.121E-04 |
| | 0.0567 | 0.0951 | 0.9483 | -C.1904 | -0.2539 | 3.1040 | 0.4420 | 1.0000 | 0.6000 | -0.5012 | | | |
| 66 | C.70000 | C.0 | 0.25802 | 0.70000 | 0.48317 | 0.63170 | 0.00198 | 3.86773 | -0.00024 | 0.00429 | 1.00000 | -0.528E+01 | C.117E+01 |
| | 0.1799 | C.2717 | C.9755 | -0.2013 | 0.00017 | 3.1391 | 0.4420 | 0.7000 | 0.7000 | -0.5125 | | | |
| 67 | 0.70000 | C.10000 | 0.26513 | 0.70000 | 0.48725 | 0.63361 | 0.08928 | 3.86242 | -0.00185 | -0.00503 | 1.00000 | 0.276E+00 | C.324E-01 |
| | 0.1733 | C.2616 | 0.9708 | -0.2126 | -0.02257 | 3.1372 | 0.4420 | 0.7071 | 0.7000 | -0.5116 | | | |
| 68 | 0.70000 | C.20000 | 0.28603 | 0.70000 | 0.49903 | 0.63817 | 0.18127 | 3.84465 | 0.00127 | -0.00153 | 1.00000 | 0.410E+00 | C.798E-02 |
| | 0.1597 | C.2409 | C.9773 | -0.2035 | -0.0585 | 3.1299 | 0.4420 | 0.7280 | 0.7000 | -0.5098 | | | |
| 69 | 0.70000 | C.30000 | 0.31960 | 0.70000 | 0.51701 | 0.64601 | 0.27396 | 3.81780 | 0.00040 | -0.00544 | 1.00000 | 0.383E+00 | C.130E-01 |
| | 0.1329 | C.2001 | C.9743 | -0.2068 | -0.0895 | 3.1213 | 0.4420 | 0.7616 | 0.7000 | -0.5067 | | | |
| 70 | 0.70000 | C.40000 | 0.36424 | 0.70000 | 0.53940 | 0.65522 | 0.37162 | 3.78137 | 0.00020 | -0.00465 | 1.00000 | 0.404E+00 | 0.836E-02 |
| | 0.0981 | C.1475 | C.9701 | -0.2104 | -0.1209 | 3.1117 | 0.4420 | 0.8062 | 0.7000 | -0.5036 | | | |
| 71 | 0.70000 | C.50000 | 0.41825 | 0.70000 | 0.56491 | 0.66564 | 0.47204 | 3.73714 | 0.00083 | -0.00506 | 1.00000 | 0.410E+00 | 0.788E-02 |
| | 0.0554 | C.0831 | C.9646 | -0.2142 | -0.1537 | 3.1038 | 0.4420 | 0.8502 | 0.7000 | -0.5012 | | | |
| 72 | C.70000 | C.60000 | 0.47997 | 0.70000 | 0.58863 | 0.67708 | 0.57609 | 3.68655 | 0.00100 | -0.00561 | 1.00000 | 0.413E+00 | 0.752E-02 |
| | 0.0055 | C.0083 | 0.9577 | -0.2181 | -0.1876 | 3.1004 | 0.4420 | 0.9220 | 0.7000 | -0.5000 | | | |
| 73 | 0.70000 | C.70000 | 0.54797 | 0.70000 | 0.61145 | 0.68939 | 0.68337 | 3.62892 | 0.00535 | -0.00304 | 1.00000 | 0.429E+00 | C.838E-02 |
| | 0.0464 | C.0696 | 0.9459 | -0.2205 | -0.2213 | 3.1018 | 0.4420 | 0.9899 | 0.7000 | -0.5008 | | | |
| 74 | C.80000 | C.0 | 0.35802 | 0.80000 | 0.53638 | 0.74590 | 0.00254 | 3.78667 | -0.00301 | 0.00460 | 1.00000 | -0.630E+01 | 0.167E+01 |
| | 0.1024 | C.1539 | 0.9706 | -0.2406 | 0.00307 | 3.1131 | 0.4420 | 0.8000 | 0.8000 | -0.5040 | | | |
| 75 | C.80000 | C.10000 | 0.36424 | 0.80000 | 0.53961 | 0.74762 | 0.09069 | 3.78137 | -0.00153 | -0.00515 | 1.00000 | 0.280E+00 | 0.387E-01 |
| | 0.0981 | C.1475 | 0.9701 | -0.2408 | -0.0308 | 3.1117 | 0.4420 | 0.8062 | 0.8000 | -0.5036 | | | |
| 76 | 0.80000 | C.20000 | 0.38264 | 0.80000 | 0.54806 | 0.75215 | 0.18492 | 3.76595 | 0.00754 | -0.00526 | 1.00000 | 0.359E+00 | C.213E-01 |
| | 0.0845 | C.1270 | 0.9684 | -0.2418 | -0.0612 | 3.1082 | 0.4420 | 0.8246 | 0.8000 | -0.5027 | | | |
| 77 | C.80000 | C.30000 | 0.41242 | 0.80000 | 0.56146 | 0.75875 | 0.28125 | 3.74141 | 0.00145 | -0.00491 | 1.00000 | 0.391E+00 | C.145E-01 |
| | 0.0612 | C.0919 | 0.9654 | -0.2449 | -0.0922 | 3.1040 | 0.4420 | 0.8544 | 0.8000 | -0.5014 | | | |
| 78 | 0.80000 | C.40000 | 0.45245 | 0.80000 | 0.57807 | 0.76766 | 0.37946 | 3.70887 | 0.00122 | -0.00627 | 1.00000 | 0.394E+00 | C.137E-01 |
| | 0.0283 | 0.0425 | 0.9610 | -0.2472 | -0.1244 | 3.1010 | 0.4420 | 0.8944 | 0.8000 | -0.5003 | | | |
| 79 | 0.80000 | C.50000 | 0.50142 | 0.80000 | 0.59631 | 0.77754 | 0.48146 | 3.66836 | 0.00200 | -0.00549 | 1.00000 | 0.405E+00 | C.107E-01 |
| | 0.0108 | C.0162 | 0.9554 | -0.2502 | -0.1571 | 3.1001 | 0.4420 | 0.9434 | 0.8000 | -0.5000 | | | |
| 80 | 0.80000 | C.60000 | 0.55802 | 0.80000 | 0.61444 | 0.78632 | 0.58972 | 3.62175 | -0.00162 | -0.00124 | 1.00000 | 0.436E+00 | C.345E-04 |
| | 0.0567 | 0.0851 | 0.9483 | -0.2538 | -0.1904 | 3.1040 | 0.4420 | 1.0000 | 0.8000 | -0.5012 | | | |
| 81 | C.80000 | C.0 | 0.45802 | 0.90000 | 0.58239 | 0.86291 | 0.00379 | 3.70479 | -0.00198 | 0.00593 | 1.00000 | -0.782E+01 | C.249E+01 |
| | 0.0243 | C.0365 | 0.9604 | -0.2786 | 0.00067 | 3.1005 | 0.4420 | 0.9000 | 0.9000 | -0.5002 | | | |
| 82 | 0.80000 | C.10000 | 0.46356 | 0.90000 | 0.58247 | 0.86415 | 0.09608 | 3.69886 | 0.00142 | 0.00025 | 1.00000 | 0.450E+00 | -C.838E-03 |
| | 0.0213 | 0.0320 | 0.9600 | -0.2783 | -0.0309 | 3.0996 | 0.4420 | 0.9055 | 0.9000 | -0.5002 | | | |
| 83 | C.80000 | C.20000 | 0.47997 | 0.90000 | 0.58863 | 0.86783 | 0.19289 | 3.68654 | -0.00291 | -0.00157 | 1.00000 | 0.433E+00 | -0.242E-03 |
| | 0.0055 | C.0082 | 0.9577 | -0.2809 | -0.0624 | 3.1004 | 0.4420 | 0.9220 | 0.9000 | -0.5000 | | | |
| 84 | C.80000 | C.30000 | 0.50670 | 0.90000 | 0.59809 | 0.87500 | 0.28735 | 3.66483 | -0.00198 | -0.00657 | 1.00000 | 0.372E+00 | C.188E-01 |
| | 0.0168 | C.0252 | C.9545 | -0.2828 | -0.0945 | 3.1011 | 0.4420 | 0.9487 | 0.9000 | -0.5001 | | | |
| 85 | 0.80000 | C.40000 | 0.54290 | 0.90000 | 0.60539 | 0.88314 | 0.38752 | 3.63513 | -0.00202 | -0.00739 | 1.00000 | 0.388E+00 | C.143E-01 |
| | 0.0463 | C.0694 | 0.9500 | -0.2852 | -0.1273 | 3.1034 | 0.4420 | 0.9849 | 0.9000 | -0.5008 | | | |
| 86 | 1.00000 | C.0 | 0.55802 | 1.00000 | 3.61444 | 0.98289 | 0.0 | 3.62175 | -0.00238 | 0.0 | 1.00000 | 0.100E+06 | C.100E+06 |
| | 0.0567 | C.0851 | C.9483 | -0.3173 | 0.0 | 3.1040 | 0.4420 | 1.0000 | 1.0000 | -0.5012 | | | |
| 87 | -0.10000 | C.10000 | -0.31056 | -0.10000 | 0.03820 | -0.02734 | 0.02734 | 4.27621 | 0.01341 | -0.11343 | 1.00000 | -0.718E+00 | -0.129E-04 |

```
     0.4716  C.7497  0.9999  0.0116 -0.0116  3.5203  0.4420  0.1414 -0.1000 -0.6944
88-0.10000 0.20000-0.21837-0.10000 0.11679-0.05453 0.10906 4.23378 0.00747-0.01495 1.00000  0.271E-01-0.238E-05
     0.4415  C.6958  0.9992  0.0180 -0.0360  3.4449  0.4420  0.2236 -0.1000 -0.5886
89-0.10000 C.30000-0.12575-0.10000 0.20059-0.06825 0.20624 4.17058 0.00535-0.00620 1.00000  0.344E+00 0.324E-02
     0.4055  C.6331  0.9978  0.0219 -0.0631  3.3649  0.4420  0.3162 -0.1000 -0.5722
90-0.10000 C.40000-0.02967-0.10000 0.28181-0.07655 0.30847 4.09841 0.00271-0.00057 1.00000  0.436E+00 0.256E-02
     0.3611  C.5585  0.9953  0.0241 -0.0939  3.2917  0.4420  0.4123 -0.1000 -0.5552
91-0.10000 0.50000 0.06792-0.10000 0.35757-0.08155 0.41409 4.02145 0.00410 0.00068 1.00000  0.447E+00 0.424E-02
     0.3068  C.4702  0.9914  0.0265 -0.1281  3.2282  0.4420  0.5099 -0.1000 -0.5385
92-0.10000 C.60000 C.16630-0.10000 0.42646-0.08439 0.52260 3.94261 0.00722-0.00055 1.00000  0.436E+00 C.706E-02
     0.2433  C.3697  0.9859  0.0288 -0.1649  3.1763  0.4420  0.6083 -0.1000 -0.5234
93-0.10000 C.70000 C.26513-0.10000 0.48726-0.08819 0.63362 3.86242 0.00522-0.00165 1.00000  0.433E+00 C.495E-02
     0.1733  C.2616  0.9788  0.0258 -0.2126  3.1372  0.4420  0.7071 -0.1000 -0.5116
94-0.10000 C.80000 C.36424-0.10000 0.53941-0.09033 0.74766 3.78137 0.00580-0.00145 1.00000  0.436E+00 C.561E-02
     0.0981  C.1475  C.9701  0.0309 -0.2407  3.1117  0.4420  0.8062 -0.1000 -0.5036
95-C.10000 C.90000 0.46356-0.10000 0.58267-0.09215 0.86458 3.69886 0.00586 0.00208 1.00000  0.445E+00 C.610E-02
     0.0214  0.0321  C.9600  0.0316 -0.2783  3.0996  0.4420  0.9055 -0.1000 -0.5002
96-C.20000 0.0     -0.24198-0.20000 0.09460-0.09790 0.0     4.24767 0.01656 0.0      1.00000  0.100E+06 C.100E+06
     0.4508  C.7123  0.9555  0.0330  0.0       3.4653  0.4420  0.2000 -0.2000 -0.5933
97-0.20000 C.10000-0.21837-0.20000 0.11676-0.10917 0.05454 4.23355 0.00967-0.00484 1.00000  0.162E+00-0.296E-05
     0.4437  C.6997  0.9993  0.0345 -0.0172  3.4438  0.4420  0.2236 -0.2000 -0.5897
98-0.20000 C.20000-0.15914-0.20000 0.17099-0.12885 0.12954 4.19425 0.00408 0.00145 1.00000  0.481E+00 0.563E-02
     0.4227  C.6628  0.9985  0.0392 -0.0377  3.3921  0.4420  0.2828 -0.2000 -0.5797
99-C.20000 C.30000-0.08143-0.20000 0.23886-0.14577 0.21939 4.13809 0.00409-0.00201 1.00000  0.412E+00 0.264E-02
     0.3861  C.6002  0.9968  0.0459 -0.0665  3.3299  0.4420  0.3606 -0.2000 -0.5644
100-0.20000 C.40000 0.00523-0.20000 0.30970-0.15752 0.31799 4.07126 0.00545 0.00053 1.00000  0.452E+00 C.593E-02
     0.3421  C.5273  C.9949  0.0458 -0.0979  3.2678  0.4420  0.4472 -0.2000 -0.5489
101-0.20000 C.50000 0.09654-0.20000 0.37842-0.16685 0.42117 3.99871 0.00471 0.00052 1.00000  0.446E+00 0.499E-02
     0.2888  0.4414  0.9869  0.0534 -0.1317  3.2119  0.4420  0.5385 -0.2000 -0.5337
102-0.20000 C.60000 C.19047-0.20000 0.44205-0.17410 0.52819 3.92263 0.00434 0.00156 1.00000  0.451E+00 0.487E-02
     0.2280  C.3460  0.9844  0.0564 -0.1664  3.1652  0.4420  0.6325 -0.2000 -0.5204
103-C.20000 C.70000 0.28603-0.20000 0.49904-0.17932 0.63854 3.84469 0.00461 0.00203 1.00000  0.452E+00 0.520E-02
     0.1597  C.2409  C.9773  0.0550 -0.2034  3.1299  0.4420  0.7280 -0.2000 -0.5098
104-C.20000 0.80000 0.38264-0.20000 0.54807-0.18437 0.75218 3.76554 0.00622 0.00079 1.00000  0.445E+00 0.642E-02
     0.0845  C.1270  C.9684  0.0613 -0.2417  3.1082  0.4420  0.8246 -0.2000 -0.5027
105-0.20000 C.90000 0.47997-0.20000 0.58862-0.19315 0.86843 3.68655 0.00471-0.00152 1.00000  0.435E+00 0.428E-02
     0.0055  C.0083  0.9577  0.0629 -0.2807  3.1035  0.4420  0.9220 -0.2000 -0.5000
106-0.30000 0.0     -0.14198-0.30000 0.18629-0.20043 0.00038 4.18233 0.00435 0.00275 1.00000 -0.346E+01-0.233E+00
     0.4141  C.6480  C.9982  0.0606  0.0007  3.3779  0.4420  0.3000 -0.3000 -0.5759
107-0.30000 C.10000-0.12575-0.30000 0.20059-0.21529 0.06899 4.17098 0.00785-0.00043 1.00000  0.421E+00 0.651E-02
     0.4054  C.6331  0.9978  0.0636 -0.1206  3.3649  0.4420  0.3162 -0.3000 -0.5722
108-C.30000 C.20000-0.08143-0.30000 0.23806-0.21891 0.14648 4.13809 0.00461-0.00011 1.00000  0.440E+00 0.444E-02
     0.3861  C.6002  0.9968  0.0671 -0.1441  3.3299  0.4420  0.3606 -0.3000 -0.5644
109-C.30000 C.30000-0.01772-0.30000 0.29149-0.23329 0.23426 4.08932 0.00463 0.00043 1.00000  0.448E+00 0.506E-02
     0.3539  C.5467  C.9948  0.0724 -0.1712  3.2835  0.4420  0.4243 -0.3000 -0.5528
110-0.30000 C.40000 0.05802-0.30000 0.35019-0.24593 0.32977 4.02951 0.00391 0.00115 1.00000  0.454E+00 C.481E-02
     0.3121  C.4786  C.9918  0.0772 -0.1016  3.2343  0.4420  0.5000 -0.3000 -0.5399
111-C.30000 C.50000 0.14111-0.30000 0.41954-0.25678 0.43098 3.96288 0.00445 0.00066 1.00000  0.448E+00 0.501E-02
```

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.2602 | C.3963 | 0.9875 | 0.0819 | -0.1349 | 3.1884 | 0.4420 | 0.5831 | -0.3000 | -0.5270 | | | | |
| 112- | -0.30000 | 0.60000 | 0.22884 | -0.30000 | 0.46587 | -0.26609 | 0.53661 | 3.85188 | 0.00521 | 0.00012 | 1.00000 | 0.443E+00 | 0.527E-02 | |
| | 0.1998 | C.3023 | 0.9816 | 0.0861 | -0.1703 | 3.1500 | 0.4420 | 0.6708 | -0.3000 | -0.5155 | | | | |
| 113- | -0.30000 | 0.70000 | 0.31960 | -0.30000 | 0.51702 | -0.27333 | 0.64628 | 3.81779 | 0.00666 | 0.00092 | 1.00000 | 0.446E+00 | 0.706E-02 | |
| | 0.1329 | C.2001 | 0.9743 | 0.0897 | -0.2068 | 3.1213 | 0.4420 | 0.7616 | -0.3000 | -0.5067 | | | | |
| 114- | -0.30000 | 0.80000 | 0.41242 | -0.30000 | 0.56145 | -0.28206 | 0.75045 | 3.74141 | 0.00356 | 0.00098 | 1.00000 | 0.446E+00 | 0.393E+02 | |
| | 0.0612 | C.0919 | 0.9654 | 0.0920 | -0.2440 | 3.1040 | 0.4420 | 0.8544 | -0.3000 | -0.5014 | | | | |
| 115- | -0.30000 | 0.90000 | 0.50670 | -0.30000 | 0.59808 | -0.28867 | 0.87456 | 3.66484 | 0.00534 | -0.00262 | 1.00000 | 0.433E+00 | 0.416E-02 | |
| | 0.0168 | C.0252 | 0.9545 | 0.0947 | -0.2829 | 3.1011 | 0.4420 | 0.9487 | -0.3000 | -0.5001 | | | | |
| 116- | -0.40000 | 0.0 | -0.04198 | -0.40000 | 0.27180 | -0.30482 | 0.00060 | 4.10802 | 0.00266 | 0.00281 | 1.00000 | -0.373E+01 | -0.388E+00 | |
| | 0.3668 | C.5681 | 0.9957 | 0.0932 | 0.0307 | 3.3096 | 0.4420 | 0.4010 | -0.4000 | -0.5573 | | | | |
| 117- | -0.40000 | 0.10000 | -0.02967 | -0.40000 | 0.28182 | -0.30811 | 0.07838 | 4.09841 | 0.00264 | 0.00553 | 1.00000 | 0.691E+00 | 0.262E-01 | |
| | 0.3611 | C.5585 | 0.9953 | 0.0944 | -0.0221 | 3.2917 | 0.4420 | 0.4123 | -0.4000 | -0.5552 | | | | |
| 118- | -0.40000 | 0.20000 | 0.00523 | -0.40000 | 0.33970 | -0.31679 | 0.15994 | 4.07126 | 0.00391 | 0.00424 | 1.00000 | 0.530E+00 | 0.126E-01 | |
| | 0.2421 | C.5273 | 0.9940 | 0.0981 | -0.0476 | 3.2678 | 0.4420 | 0.4472 | -0.4000 | -0.5486 | | | | |
| 119- | -0.40000 | 0.30000 | 0.05802 | -0.40000 | 0.35020 | -0.32839 | 0.24778 | 4.02951 | 0.00355 | 0.00242 | 1.00000 | 0.474E+00 | 0.683E-02 | |
| | 0.2121 | C.4786 | 0.9918 | 0.1026 | -0.0759 | 3.2343 | 0.4420 | 0.5000 | -0.4000 | -0.5395 | | | | |
| 120- | -0.40000 | 0.40000 | 0.12370 | -0.40000 | 0.39759 | -0.34025 | 0.34226 | 3.97660 | 0.00254 | 0.00327 | 1.00000 | 0.472E+00 | 0.585E-02 | |
| | 0.2726 | C.4158 | 0.9886 | 0.1072 | -0.1060 | 3.1970 | 0.4420 | 0.5657 | -0.4000 | -0.5258 | | | | |
| 121- | -0.40000 | 0.50000 | 0.19833 | -0.40000 | 0.44706 | -0.35136 | 0.44229 | 3.91658 | 0.00475 | 0.00156 | 1.00000 | 0.453E+00 | 0.604E-02 | |
| | 0.2214 | C.3359 | 0.9838 | 0.1126 | -0.1394 | 3.1621 | 0.4420 | 0.6403 | -0.4000 | -0.5192 | | | | |
| 122- | -0.40000 | 0.60000 | 0.27913 | -0.40000 | 0.49516 | -0.36150 | 0.54691 | 3.85082 | 0.00543 | 0.00154 | 1.00000 | 0.451E+00 | 0.647E-02 | |
| | 0.1634 | C.2466 | 0.9777 | 0.1171 | -0.1741 | 3.1326 | 0.4420 | 0.7211 | -0.4000 | -0.5103 | | | | |
| 123- | -0.40000 | 0.70000 | 0.36424 | -0.40000 | 0.53549 | -0.37223 | 0.65468 | 3.78137 | 0.00361 | -0.00042 | 1.00000 | 0.440E+00 | 0.337E-02 | |
| | 0.0981 | C.1475 | 0.9701 | 0.1208 | -0.2105 | 3.1117 | 0.4420 | 0.8062 | -0.4000 | -0.5036 | | | | |
| 124- | -0.40000 | 0.80000 | 0.45245 | -0.40000 | 0.57896 | -0.38047 | 0.76716 | 3.70887 | 0.00468 | 0.00043 | 1.00000 | 0.444E+00 | 0.489E-02 | |
| | 0.0283 | C.0425 | 0.9610 | 0.1242 | -0.2472 | 3.1017 | 0.4420 | 0.8944 | -0.4000 | -0.5003 | | | | |
| 125- | -0.40000 | 0.90000 | 0.54290 | -0.40000 | 0.60588 | -0.38856 | 0.88285 | 3.63514 | 0.00640 | -0.00243 | 1.00000 | 0.434E+00 | 0.532E-02 | |
| | 0.0463 | C.0694 | 0.9509 | 0.1273 | -0.2853 | 3.1034 | 0.4420 | 0.9849 | -0.4000 | -0.5008 | | | | |
| 126- | -0.50000 | 0.0 | 0.05802 | -0.50000 | 0.35020 | -0.41137 | 0.00138 | 4.02550 | 0.00140 | 0.00472 | 1.00000 | -0.409E+01 | -0.582E+00 | |
| | 0.3121 | C.4786 | 0.9918 | 0.1276 | 0.0710 | 3.2343 | 0.4420 | 0.5000 | -0.5000 | -0.5399 | | | | |
| 127- | -0.50000 | 0.10000 | 0.06792 | -0.50000 | 0.35757 | -0.41359 | 0.08406 | 4.02145 | 0.00100 | 0.00429 | 1.00000 | 0.614E+00 | 0.233E-01 | |
| | 0.3068 | C.4702 | 0.9914 | 0.1284 | -0.0247 | 3.2282 | 0.4420 | 0.5099 | -0.5000 | -0.5385 | | | | |
| 128- | -0.50000 | 0.20000 | 0.09654 | -0.50000 | 0.37842 | -0.41983 | 0.17021 | 3.99871 | 0.00363 | 0.00557 | 1.00000 | 0.550E+00 | 0.180E-01 | |
| | 0.2888 | C.4414 | 0.9859 | 0.1318 | -0.0513 | 3.2119 | 0.4420 | 0.5385 | -0.5000 | -0.5337 | | | | |
| 129- | -0.50000 | 0.30000 | 0.14111 | -0.50000 | 0.43555 | -0.42940 | 0.25540 | 3.96287 | 0.00348 | 0.00277 | 1.00000 | 0.476E+00 | 0.816E-02 | |
| | 0.2602 | C.3963 | 0.9875 | 0.1358 | -0.0805 | 3.1884 | 0.4420 | 0.5831 | -0.5000 | -0.5270 | | | | |
| 130- | -0.50000 | 0.40000 | 0.19833 | -0.50000 | 0.44706 | -0.43988 | 0.35438 | 3.91659 | 0.00432 | 0.00256 | 1.00000 | 0.465E+00 | 0.755E-02 | |
| | 0.2216 | C.3359 | 0.9838 | 0.1405 | -0.1113 | 3.1621 | 0.4420 | 0.6403 | -0.5000 | -0.5192 | | | | |
| 131- | -0.50000 | 0.50000 | 0.26513 | -0.50000 | 0.48726 | -0.45041 | 0.45430 | 3.86242 | 0.00596 | 0.00231 | 1.00000 | 0.458E+00 | 0.830E-02 | |
| | 0.1733 | C.2616 | 0.9788 | 0.1455 | -0.1441 | 3.1372 | 0.4423 | 0.7071 | -0.5000 | -0.5116 | | | | |
| 132- | -0.50000 | 0.60000 | 0.33704 | -0.50000 | 0.52699 | -0.46236 | 0.55741 | 3.80144 | 0.00255 | 0.00241 | 1.00000 | 0.455E+00 | 0.461E-02 | |
| | 0.1191 | C.1792 | 0.9727 | 0.1491 | -0.1781 | 3.1163 | 0.4420 | 0.7810 | -0.5000 | -0.5054 | | | | |
| 133- | -0.50000 | 0.70000 | 0.41825 | -0.50000 | 0.56420 | -0.47230 | 0.66546 | 3.73714 | 0.00463 | 0.00053 | 1.00000 | 0.444E+00 | 0.501E-02 | |
| | 0.0554 | C.0831 | 0.9646 | 0.1537 | -0.2142 | 3.1038 | 0.4420 | 0.8602 | -0.5000 | -0.5012 | | | | |
| 134- | -0.50000 | 0.80000 | 0.50142 | -0.50000 | 0.57631 | -0.48204 | 0.77728 | 3.66836 | 0.00463 | 0.00147 | 1.00000 | 0.448E+00 | 0.555E-02 | |
| | 0.0168 | C.0162 | 0.9554 | 0.1570 | -0.2503 | 3.1021 | 0.4420 | 0.9434 | -0.5000 | -0.5000 | | | | |
| 135- | -0.60000 | 0.0 | 0.15802 | -0.60000 | 0.42001 | -0.52326 | 0.00221 | 3.94531 | 0.00215 | 0.00568 | 1.00000 | -0.459E+01 | -0.835E+00 | |

```
     0.2487  0.3782  0.9864  0.1643  0.0912  3.1803  0.4420  0.6000 -0.6000 -0.5245

136-0.60000 0.10000 0.16630-0.60000 0.42645-0.52216 0.08705 3.94261 0.00205-0.00029 1.00000  0.432E+00 0.358E-03
     0.2433  0.3696  0.9859  0.1650 -0.0275  3.1763  0.4420  0.6083 -0.6000 -0.5234

137-0.60000 0.20000 0.19047-0.60000 0.44206-0.52682 0.17821 3.92262 0.00183 0.00583 1.00000  0.547E+00 0.197E-01
     0.2280  0.3460  0.9844  0.1670 -0.0545  3.1652  0.4420  0.6325 -0.6000 -0.5204

138-0.60000 0.30000 0.22884-0.60000 0.46598-0.53444 0.27034 3.89188 0.00485 0.00472 1.00000  0.497E+00 0.144E-01
     0.1998  0.3023  0.9816  0.1712 -0.0843  3.1500  0.4420  0.6708 -0.6000 -0.5155

139-0.60000 0.40000 0.27913-0.60000 0.49515-0.54448 0.36515 3.85083 0.00351 0.00215 1.00000  0.460E+00 0.675E-02
     0.1634  0.2465  0.9777  0.1749 -0.1159  3.1326  0.4420  0.7211 -0.6000 -0.5103

140-0.60000 0.50000 0.33914-0.60000 0.52699-0.55494 0.46502 3.80144 0.00222 0.00297 1.00000  0.461E+00 0.581E-02
     0.1191  0.1792  0.9727  0.1788 -0.1483  3.1163  0.4420  0.7810 -0.6000 -0.5054

141-0.60000 0.60000 0.40655-0.60000 0.55650-0.56579 0.56894 3.74619 0.00284 0.00261 1.00000  0.456E+00 0.547E-02
     0.0660  0.0990  0.9660  0.1831 -0.1824  3.1046  0.4420  0.8485 -0.6000 -0.5016

142-0.60000 0.70000 0.47997-0.60000 0.58863-0.57619 0.67708 3.68655 0.00560 0.00099 1.00000  0.446E+00 0.646E-02
     0.0055  0.0083  0.9577  0.1876 -0.2181  3.1004  0.4420  0.9220 -0.6000 -0.5000

143-0.60000 0.80000 0.55802-0.60000 0.61444-0.58974 0.78631 3.62175 0.00123-0.00165 1.00000  0.436E+00-0.121E-04
     0.0567  0.0851  0.9483  0.1904 -0.2539  3.1040  0.4420  1.0000 -0.6000 -0.5012

144-0.70000 0.0     0.25802-0.70000 0.48311-0.63170 0.00198 3.86773 0.00024 0.00429 1.00000 -0.528E+01-0.117E+01
     0.1799  0.2717  0.9795  0.2013  0.0007  3.1391  0.4420  0.7000 -0.7000 -0.5125

145-0.70000 0.10000 0.26513-0.70000 0.48725-0.63298 0.09266 3.86242 0.00322 0.00429 1.00000  0.591E+00 0.341E-01
     0.1733  0.2616  0.9788  0.2028 -0.0282  3.1372  0.4420  0.7071 -0.7000 -0.5116

146-0.70000 0.20000 0.28603-0.70000 0.49503-0.63758 0.18328 3.84469-0.00006 0.00232 1.00000  0.481E+00 0.809E-02
     0.1597  0.2409  0.9773  0.2037 -0.0578  3.1299  0.4420  0.7280 -0.7000 -0.5098

147-0.70000 0.30000 0.31960-0.70000 0.51301-0.64391 0.27886 3.81780 0.00366 0.00404 1.00000  0.487E+00 0.132E-01
     0.1329  0.2001  0.9743  0.2075 -0.0880  3.1213  0.4420  0.7616 -0.7000 -0.5067

148-0.70000 0.40000 0.36424-0.70000 0.53540-0.65272 0.37566 3.78137 0.00394 0.00256 1.00000  0.463E+00 0.844E-02
     0.0981  0.1475  0.9701  0.2110 -0.1159  3.1117  0.4420  0.8062 -0.7000 -0.5036

149-0.70000 0.50000 0.41825-0.70000 0.56401-0.66241 0.47656 3.73714 0.00452 0.00242 1.00000  0.457E+00 0.792E-02
     0.0554  0.0831  0.9646  0.2149 -0.1528  3.1038  0.4420  0.8602 -0.7000 -0.5012

150-0.70000 0.60000 0.47997-0.70000 0.58863-0.67287 0.59101 3.68655 0.00535 0.00185 1.00000  0.451E+00 0.755E-02
     0.0055  0.0083  0.9577  0.2189 -0.1868  3.1004  0.4420  0.9220 -0.7000 -0.5000

151-0.70000 0.70000 0.54797-0.70000 0.61145-0.68337 0.68939 3.62892 0.00304 0.00535 1.00000  0.465E+00 0.840E-02
     0.0464  0.0696  0.9499  0.2213 -0.2205  3.1018  0.4420  0.9899 -0.7000 -0.5008

152-0.80000 0.0     0.35802-0.80000 0.53638-0.74590 0.00254 3.78667 0.00307 0.00460 1.00000 -0.630E+01-0.167E+01
     0.1024  0.1539  0.9706  0.2406  0.0007  3.1131  0.4420  0.8000 -0.8000 -0.5040

153-0.80000 0.10000 0.36424-0.80000 0.53541-0.74694 0.09613 3.78137 0.00275 0.00462 1.00000  0.594E+00 0.406E-01
     0.0981  0.1475  0.9701  0.2409 -0.0294  3.1117  0.4420  0.8062 -0.8000 -0.5036

154-0.80000 0.20000 0.38264-0.80000 0.54806-0.75059 0.19073 3.76595 0.00195 0.00489 1.00000  0.521E+00 0.219E-01
     0.0845  0.1270  0.9684  0.2421 -0.0558  3.1082  0.4420  0.8246 -0.8000 -0.5027

155-0.80000 0.30000 0.41242-0.80000 0.56146-0.75659 0.28709 3.74141 0.00211 0.00468 1.00000  0.492E+00 0.147E-01
     0.0612  0.0919  0.9654  0.2444 -0.0911  3.1040  0.4420  0.8544 -0.8000 -0.5014

156-0.80000 0.40000 0.45245-0.80000 0.57877-0.76417 0.39645 3.70887 0.00328 0.00474 1.00000  0.479E+00 0.138E-01
     0.0283  0.0425  0.9610  0.2478 -0.1231  3.1010  0.4420  0.8944 -0.8000 -0.5003

157-0.80000 0.50000 0.50142-0.80000 0.59631-0.77354 0.48803 3.66836 0.00406-0.00420 1.00000  0.468E+00 0.108E-01
     0.0108  0.0162  0.9554  0.2508 -0.1561  3.1001  0.4420  0.9434 -0.8000 -0.5000

158-0.80000 0.60000 0.55802-0.80000 0.61444-0.78632 0.58572 3.62175-0.00162-0.00124 1.00000  0.436E+00-0.345E-04
     0.0567  0.0851  0.9483  0.2538 -0.1904  3.1043  0.4420  1.0000 -0.8000 -0.5012

159-0.90000 0.0     0.45802-0.90000 0.59029-0.86291 0.00379 3.70498 0.00398 0.00593 1.00000 -0.782E+01-0.240E+01
```

```
      0.0243  0.0369  0.9604  0.2786  0.0007  3.1005  0.4420  0.9000 -0.9000 -0.5002

160-0.60000 0.10000 0.46356-0.90000 0.58247-0.86415 0.09608 3.69886-0.00142 0.00025 1.00000  0.450E+00 0.838E-03
     0.0213  0.0320  0.9600  0.2783 -0.0309  3.0996  0.4420  0.9055 -0.9000 -0.5002

161-0.60000 0.20000 0.47997-0.90000 0.58863-0.86783 0.19289 3.68654 0.00281-0.00057 1.00000  0.433E+00 0.242E-03
     0.0055  0.0082  0.9577  0.2808 -0.0624  3.1004  0.4420  0.9220 -0.9000 -0.5000

162-0.60000 0.30000 0.50670-0.90000 0.59879-0.87240 0.29512 3.66483 0.00576 0.00439 1.00000  0.487E+00 0.190E-01
     0.0168  0.0252  0.9545  0.2832 -0.0939  3.1011  0.4420  0.9487 -0.9000 -0.5001

163-0.60000 0.40000 0.54290-0.90000 0.60585-0.87973 0.39559 3.63513 0.00678 0.00341 1.00000  0.468E+00 0.145E-01
     0.0463  0.0694  0.9503  0.2857 -0.1264  3.1034  0.4420  0.9849 -0.9000 -0.5008

164-1.00000 0.0     0.55892-1.00000 0.61444-0.98289 0.0     3.62176 0.00238 0.0     1.00000  0.100E+06 0.100E+06
     0.0167  0.0851  0.9483  0.3173  0.0     3.1040  0.4420  1.0000 -1.0000 -0.5012

1MIRROR.IMAGE EKEW RAYS.FOLLOW
```

| IMAGE RAY | RAY | RAYX | RAYZ | OPL | YIN | ZIN | NTNCTY | XDIAPT<br>YDIAPT |
|---|---|---|---|---|---|---|---|---|
| 165 | 1 | 0.0 | -0.2000000 | 4.24781704 | 0.0 | 0.0198995 | 1.0000000 | -0.143E+00<br>0.0 |
| 166 | 2 | 0.0 | -0.3000001 | 4.18230820 | 0.0 | 0.0035946 | 1.0000000 | 0.376E+00<br>0.0 |
| 167 | 3 | 0.0 | -0.4000001 | 4.10801315 | 0.0057445 | 0.0026656 | 1.0000000 | 0.413E+00<br>0.571E-02 |
| 168 | 4 | 0.0 | -0.5000001 | 4.02949905 | 0.0031240 | 0.0014027 | 1.0000000 | 0.431E+00<br>0.312E-02 |
| 169 | 5 | 0.0 | -0.6000001 | 3.94930363 | 0.0036701 | 0.0022022 | 1.0000000 | 0.429E+00<br>0.366E-02 |
| 170 | 6 | 0.0 | -0.7000002 | 3.86772346 | 0.0048978 | 0.0002471 | 1.0000000 | 0.441E+00<br>0.450E-02 |
| 171 | 7 | 0.0 | -0.8000002 | 3.78667068 | 0.0051622 | 0.0030653 | 1.0000000 | 0.430E+00<br>0.515E-02 |
| 172 | 8 | 0.0 | -0.9000002 | 3.70408630 | 0.0064321 | 0.0009802 | 1.0000000 | 0.439E+00<br>0.643E-02 |
| 173 | 9 | 0.1000000 | -0.1000000 | 4.27620602 | -0.0134138 | 0.0134328 | 1.0000000 | -0.718E+00<br>0.129E-04 |
| 174 | 10 | 0.1000000 | -0.2000000 | 4.23377800 | -0.0074725 | 0.0145505 | 1.0000000 | 0.271E-01<br>0.238E-05 |
| 175 | 11 | 0.1000000 | -0.3000001 | 4.17058236 | 0.0005957 | 0.0081937 | 1.0000000 | 0.314E+00<br>0.322E-02 |
| 176 | 12 | 0.1000000 | -0.4000001 | 4.09840775 | 0.0021195 | 0.0017822 | 1.0000000 | 0.423E+00<br>0.255E-02 |
| 177 | 13 | 0.1000000 | -0.5000001 | 4.02144909 | 0.0040449 | 0.0009454 | 1.0000000 | 0.435E+00<br>0.423E-02 |
| 178 | 14 | 0.1000000 | -0.6000001 | 3.94261169 | 0.0065244 | 0.0032411 | 1.0000000 | 0.423E+00<br>0.704E-02 |
| 179 | 15 | 0.1000000 | -0.7000002 | 3.86242008 | 0.0044937 | 0.0032411 | 1.0000000 | 0.426E+00<br>0.494E-02 |
| 180 | 16 | 0.1000000 | -0.8000002 | 3.78136730 | 0.0052644 | 0.0028350 | 1.0000000 | 0.431E+00<br>0.561E-02 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 181 | 17 | 0.1000000-0.9000002 | 3.69885731 | 0.0061719 | -0.0007428 | 1.0000000 | 0.445E+00<br>0.609E-02 |
| 182 | 19 | 0.2000000-0.1000000 | 4.23354816 | -0.0096710 | 0.0048371 | 1.0000000 | 0.162E+00<br>0.296E-05 |
| 183 | 20 | 0.2000000-0.2000000 | 4.19424915 | 0.0014912 | 0.0040836 | 1.0000000 | 0.338E+00<br>0.542E-02 |
| 184 | 21 | 0.2000000-0.3000001 | 4.13809490 | -0.0003188 | 0.0044667 | 1.0000000 | 0.376E+00<br>0.262E-02 |
| 185 | 22 | 0.2000000-0.4000001 | 4.07125664 | 0.0040126 | 0.0037993 | 1.0000000 | 0.403E+00<br>0.586E-02 |
| 186 | 23 | 0.2000000-0.5000001 | 3.99870968 | 0.0038123 | 0.0029189 | 1.0000000 | 0.420E+00<br>0.496E-02 |
| 187 | 24 | 0.2000000-0.6000001 | 3.92262745 | 0.0044113 | 0.0013566 | 1.0000000 | 0.434E+00<br>0.486E-02 |
| 188 | 25 | 0.2000000-0.7000002 | 3.84469032 | 0.0049873 | 0.0007067 | 1.0000000 | 0.439E+00<br>0.519E-02 |
| 189 | 26 | 0.2000000-0.8000002 | 3.76593876 | 0.0058548 | 0.0022324 | 1.0000000 | 0.433E+00<br>0.640E-02 |
| 190 | 27 | 0.2000000-0.9000002 | 3.68655014 | 0.0034583 | 0.0037356 | 1.0000000 | 0.425E+00<br>0.428E-02 |
| 191 | 29 | 0.3000001-0.1000000 | 4.17098427 | -0.0065413 | 0.0043663 | 1.0000000 | 0.241E+00<br>0.622E-02 |
| 192 | 30 | 0.3000001-0.2000000 | 4.13809395 | -0.0018694 | 0.0042081 | 1.0000000 | 0.349E+00<br>0.434E-02 |
| 193 | 31 | 0.3000001-0.3000001 | 4.08931923 | 0.0004252 | 0.0046253 | 1.0000000 | 0.378E+00<br>0.498E-02 |
| 194 | 32 | 0.3000001-0.4000001 | 4.02950668 | 0.0022334 | 0.0034167 | 1.0000000 | 0.409E+00<br>0.476E-02 |
| 195 | 33 | 0.3000001-0.5000001 | 3.96287727 | 0.0028701 | 0.0035567 | 1.0000000 | 0.416E+00<br>0.498E-02 |
| 196 | 34 | 0.3000001-0.6000001 | 3.89187622 | 0.0032192 | 0.0040933 | 1.0000000 | 0.418E+00<br>0.524E-02 |
| 197 | 35 | 0.3000001-0.7000002 | 3.81779099 | 0.0052586 | 0.0041849 | 1.0000000 | 0.422E+00<br>0.703E-02 |
| 198 | 36 | 0.3000001-0.8000002 | 3.74141121 | 0.0033311 | 0.0016008 | 1.0000000 | 0.436E+00<br>0.393E-02 |
| 199 | 37 | 0.3000001-0.9000002 | 3.66403879 | 0.0024558 | 0.0051180 | 1.0000000 | 0.425E+00<br>0.415E-02 |
| 200 | 39 | 0.4000001-0.1000000 | 4.09841061 | 0.0002853 | 0.0041785 | 1.0000000 | 0.195E+00<br>0.235E-01 |
| 201 | 40 | 0.4000001-0.2000000 | 4.07125568 | 0.0010406 | 0.0056564 | 1.0000000 | 0.329E+00<br>0.120E-01 |
| 202 | 41 | 0.4000001-0.3000001 | 4.02950764 | 0.0013393 | 0.0040893 | 1.0000000 | 0.350E+00<br>0.670E-02 |
| 203 | 42 | 0.4000001-0.4000001 | 3.97659969 | 0.0032655 | 0.0025432 | 1.0000000 | 0.419E+00<br>0.578E-02 |
| 204 | 43 | 0.4000001-0.5000001 | 3.91658401 | 0.0025682 | 0.0043292 | 1.0000000 | 0.412E+00<br>0.600E-02 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 206 | 45 | 0.4000001-0.7000002 | 3.78136921 | 0.0014706 | 0.0033197 | 1.0000000 | 0.427E+00<br>0.336E-02 |
| 207 | 46 | 0.4000001-0.8000002 | 3.70887089 | 0.0031533 | 0.0034804 | 1.0000000 | 0.428E+00<br>0.489E-02 |
| 208 | 47 | 0.4000001-0.9000002 | 3.63513851 | 0.0024878 | 0.0063810 | 1.0000000 | 0.421E+00<br>0.531E-02 |
| 209 | 48 | 0.5000001-0.1000000 | 4.02145481 | 0.0007316 | 0.0043819 | 1.0000000 | 0.279E+00<br>0.218E-01 |
| 210 | 50 | 0.5000001-0.2000000 | 3.95870968 | 0.0012194 | 0.0065384 | 1.0000000 | 0.322E+00<br>0.171E-01 |
| 211 | 51 | 0.5000001-0.3000001 | 3.96287441 | 0.0008025 | 0.0043737 | 1.0000000 | 0.389E+00<br>0.801E-02 |
| 212 | 52 | 0.5000001-0.4000001 | 3.91658592 | 0.0015495 | 0.0047715 | 1.0000000 | 0.400E+00<br>0.745E-02 |
| 213 | 53 | 0.5000001-0.5000001 | 3.86241627 | 0.0023125 | 0.0059635 | 1.0000000 | 0.402E+00<br>0.822E-02 |
| 214 | 54 | 0.5000001-0.6000001 | 3.80144215 | 0.0028403 | 0.0021100 | 1.0000000 | 0.431E+00<br>0.459E-02 |
| 215 | 55 | 0.5000001-0.7000002 | 3.73713970 | 0.0020005 | 0.0042123 | 1.0000000 | 0.423E+00<br>0.500E-02 |
| 216 | 56 | 0.5000001-0.8000002 | 3.66836357 | 0.0033442 | 0.0035158 | 1.0000000 | 0.425E+00<br>0.553E-02 |
| 217 | 58 | 0.6000001-0.1000000 | 3.94261456 | -0.0020880 | 0.0002881 | 1.0000000 | 0.432E+00<br>-0.358E-03 |
| 218 | 59 | 0.6000001-0.2000000 | 3.92262459 | 0.0020403 | 0.0057829 | 1.0000000 | 0.341E+00<br>0.190E-01 |
| 219 | 60 | 0.6000001-0.3000001 | 3.89187527 | 0.0008706 | 0.0067160 | 1.0000000 | 0.366E+00<br>0.141E-01 |
| 220 | 61 | 0.6000001-0.4000001 | 3.85083008 | 0.0006314 | 0.0040655 | 1.0000000 | 0.408E+00<br>0.669E-02 |
| 221 | 62 | 0.6000001-0.5000001 | 3.80144215 | 0.0025223 | 0.0027704 | 1.0000000 | 0.424E+00<br>0.577E-02 |
| 222 | 63 | 0.6000001-0.6000001 | 3.74619007 | 0.0026141 | 0.0028427 | 1.0000000 | 0.427E+00<br>0.545E-02 |
| 223 | 64 | 0.6000001-0.7000002 | 3.68654537 | 0.0018344 | 0.0053829 | 1.0000000 | 0.418E+00<br>0.643E-02 |
| 224 | 65 | 0.6000001-0.8000002 | 3.62175465 | -0.0012268 | 0.0016519 | 1.0000000 | 0.436E+00<br>0.121E-04 |
| 225 | 67 | 0.7000002-0.1000000 | 3.86242008 | -0.0018887 | 0.0050298 | 1.0000000 | 0.276E+00<br>0.324E-01 |
| 226 | 68 | 0.7000002-0.2000000 | 3.84469223 | 0.0012742 | 0.0019271 | 1.0000000 | 0.410E+00<br>0.758E-02 |
| 227 | 69 | 0.7000002-0.3000001 | 3.81779575 | 0.0004907 | 0.0054382 | 1.0000000 | 0.383E+00<br>0.130E-01 |
| 228 | 70 | 0.7000002-0.4000001 | 3.78136826 | 0.0001986 | 0.0046919 | 1.0000000 | 0.404E+00<br>0.836E-02 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 229 | 71 | 0.70C0002-0.9C00001 | 3.73713875 | 0.0098278 | 0.0050603 | 1.0000000 | 0.410E+00<br>0.788E-02 |
| 230 | 72 | 0.70C0002-0.8000001 | 3.68654537 | 0.0099997 | 0.0056100 | 1.0000000 | 0.413E+00<br>0.752E-02 |
| 231 | 73 | 0.70C0002-0.7000002 | 3.62852056 | 0.0053498 | 0.0030365 | 1.0000000 | 0.429E+00<br>0.838E-02 |
| 232 | 75 | 0.8CC0002-0.1000000 | 3.78136921 | -0.0015299 | 0.0051508 | 1.0000000 | 0.280E+00<br>0.387E-01 |
| 233 | 76 | 0.80C0002-0.2000000 | 3.76594925 | 0.0005434 | 0.0052606 | 1.0000000 | 0.359E+00<br>0.213E-01 |
| 234 | 77 | 0.8000002-0.3000001 | 3.74140835 | 0.0014886 | 0.0049132 | 1.0000000 | 0.391E+00<br>0.145E-01 |
| 235 | 78 | 0.8000002-0.4000001 | 3.70866612 | 0.0012226 | 0.0062661 | 1.0000000 | 0.394E+00<br>0.137E-01 |
| 236 | 79 | 0.80C0002-0.5000001 | 3.66835785 | 0.0019963 | 0.0054873 | 1.0000000 | 0.409E+00<br>0.107E-01 |
| 237 | 80 | 0.8CC0C02-0.6000001 | 3.62175083 | -0.0016157 | 0.0012376 | 1.0000000 | 0.436E+00<br>0.345E-04 |
| 238 | 82 | 0.9CC0C02-0.1000000 | 3.69885540 | 0.0014205 | -0.0002509 | 1.0000000 | 0.450E+00<br>-0.838E-03 |
| 239 | 83 | 0.90C0002-0.2000000 | 3.68654060 | -0.0028115 | 0.0005708 | 1.0000000 | 0.433E+00<br>-0.242E-03 |
| 240 | 84 | 0.9CC0002-0.3000001 | 3.66483402 | -0.0019777 | 0.0069733 | 1.0000000 | 0.372E+00<br>0.188E-01 |
| 241 | 85 | 0.9CC0002-0.4000001 | 3.63512611 | -0.0020176 | 0.0073020 | 1.0000000 | 0.388E+00<br>0.143E-01 |
| 242 | 87 | -0.10C0000-0.1000000 | 4.27620602 | 0.0134138 | 0.0134328 | 1.0000000 | -0.718E+00<br>-0.129E-04 |
| 243 | 88 | -0.10C0000-0.2000000 | 4.23377800 | 0.0074725 | 0.0149505 | 1.0000000 | 0.271E-01<br>-0.238E-05 |
| 244 | 89 | -0.10C0000-0.3000001 | 4.17098236 | 0.0053931 | 0.0061972 | 1.0000000 | 0.344E+00<br>0.324E-02 |
| 245 | 90 | -0.10C0000-0.4000001 | 4.09840775 | 0.0027089 | 0.0005748 | 1.0000000 | 0.436E+00<br>0.256E-02 |
| 246 | 91 | -0.10C0000-0.5000001 | 4.02144909 | 0.0040982 | -0.0006833 | 1.0000000 | 0.447E+00<br>0.424E-02 |
| 247 | 92 | -0.10C0000-0.6000001 | 3.94261169 | 0.0072236 | 0.0009497 | 1.0000000 | 0.436E+00<br>0.706E-02 |
| 248 | 93 | -0.10C0000-0.7000002 | 3.86242008 | 0.0052215 | 0.0018533 | 1.0000000 | 0.433E+00<br>0.495E-02 |
| 249 | 94 | -0.10C0000-0.8000002 | 3.78136739 | 0.0058206 | 0.0014518 | 1.0000000 | 0.436E+00<br>0.561E-02 |
| 250 | 95 | -0.10C0000-0.9000002 | 3.69886208 | 0.0059587 | -0.0020813 | 1.0000000 | 0.449E+00<br>0.610E-02 |
| 251 | 97 | -0.20C0000-0.1000000 | 4.23354916 | 0.0096713 | 0.0048371 | 1.0000000 | 0.162E+00<br>-0.296E-05 |
| 252 | 98 | -0.20C0000-0.2000000 | 4.19424915 | 0.0040841 | -0.0014917 | 1.0000000 | 0.481E+00<br>0.563E-02 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 253 | 99-0.2000000-0.3000001 | 4.13809490 | 0.0040009 | 0.0020119 | 1.0000000 | 0.412E+00<br>0.264E-02 |
| 254 | 100-0.2000000-0.4000001 | 4.07125664 | 0.0054467 | -0.0009313 | 1.0000000 | 0.452E+00<br>0.593E-02 |
| 255 | 101-0.2000000-0.5000001 | 3.99870968 | 0.0047748 | -0.0005158 | 1.0000000 | 0.446E+00<br>0.459E-02 |
| 256 | 102-0.2000000-0.6000001 | 3.92262745 | 0.0043437 | -0.0015618 | 1.0000000 | 0.451E+00<br>0.487E-02 |
| 257 | 103-0.2000000-0.7000002 | 3.84469032 | 0.0046076 | -0.0020347 | 1.0000000 | 0.452E+00<br>0.520E-02 |
| 258 | 104-0.2000000-0.8000002 | 3.76553876 | 0.0062163 | -0.0007867 | 1.0000000 | 0.445E+00<br>0.642E-02 |
| 259 | 105-0.2000000-0.9000002 | 3.68655109 | 0.0047147 | 0.0019197 | 1.0000000 | 0.435E+00<br>0.428E-02 |
| 260 | 107-0.3000001-0.1000000 | 4.17058427 | 0.0078518 | 0.0004347 | 1.0000000 | 0.421E+00<br>0.651E-02 |
| 261 | 108-0.3000001-0.2000000 | 4.13809395 | 0.0046051 | 0.0001057 | 1.0000000 | 0.440E+00<br>0.444E-02 |
| 262 | 109-0.3000001-0.3000001 | 4.08921923 | 0.0046293 | -0.0004252 | 1.0000000 | 0.448E+00<br>0.506E-02 |
| 263 | 110-0.3000001-0.4000001 | 4.02950668 | 0.0039058 | -0.0011879 | 1.0000000 | 0.454E+00<br>0.481E-02 |
| 264 | 111-0.3000001-0.5000001 | 3.96287632 | 0.0044900 | -0.0008590 | 1.0000000 | 0.448E+00<br>0.501E-02 |
| 265 | 112-0.3000001-0.6000001 | 3.89187622 | 0.0052064 | -0.0001195 | 1.0000000 | 0.443E+00<br>0.527E-02 |
| 266 | 113-0.3000001-0.7000002 | 3.81779099 | 0.0066570 | -0.0009219 | 1.0000000 | 0.446E+00<br>0.706E-02 |
| 267 | 114-0.3000001-0.8000002 | 3.74141121 | 0.0035624 | -0.0005843 | 1.0000000 | 0.446E+00<br>0.393E-02 |
| 268 | 115-0.3000001-0.9000002 | 3.66483784 | 0.0059353 | 0.0026217 | 1.0000000 | 0.433E+00<br>0.416E-02 |
| 269 | 117-0.4000001-0.1000000 | 4.09841347 | 0.0026416 | -0.0055342 | 1.0000000 | 0.691E+00<br>0.262E-01 |
| 270 | 118-0.4000001-0.2000000 | 4.07125568 | 0.0039065 | -0.0042384 | 1.0000000 | 0.530E+00<br>0.126E-01 |
| 271 | 119-0.4000001-0.3000001 | 4.02950764 | 0.0035535 | -0.0024226 | 1.0000000 | 0.474E+00<br>0.683E-02 |
| 272 | 120-0.4000001-0.4000001 | 3.97659874 | 0.0025439 | -0.0032657 | 1.0000000 | 0.472E+00<br>0.585E-02 |
| 273 | 121-0.4000001-0.5000001 | 3.91658401 | 0.0047873 | -0.0015551 | 1.0000000 | 0.453E+00<br>0.604E-02 |
| 274 | 122-0.4000001-0.6000001 | 3.85082245 | 0.0054280 | -0.0015447 | 1.0000000 | 0.451E+00<br>0.647E-02 |
| 275 | 123-0.4000001-0.7000002 | 3.78137016 | 0.0036079 | 0.0014176 | 1.0000000 | 0.440E+00<br>0.337E-02 |
| 276 | 124-0.4000001-0.8000002 | 3.70887089 | 0.0046762 | -0.0004343 | 1.0000000 | 0.444E+00<br>0.489E-02 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 277 | 125-0.40C0001-0.5000002 | 3.63513851 | 0.0064029 | 0.0024297 | 1.0000000 | 0.434E+00<br>0.532E-02 |
| 278 | 127-0.50C0001-0.1000000 | 4.02145481 | 0.0010009 | -0.0042852 | 1.0000000 | 0.614E+00<br>0.233E-01 |
| 279 | 128-0.50C0C01-0.2000000 | 3.95870968 | 0.0036254 | -0.0055743 | 1.0000000 | 0.550E+00<br>0.180E-01 |
| 280 | 129-0.50C0001-0.3000001 | 3.96287441 | 0.0034848 | -0.0027714 | 1.0000000 | 0.476E+00<br>0.816E-02 |
| 281 | 130-0.50C0001-0.4000001 | 3.91658592 | 0.0043177 | -0.0025625 | 1.0000000 | 0.465E+00<br>0.755E-02 |
| 282 | 131-0.50C0001-0.5000001 | 3.86241627 | 0.0059636 | -0.0023128 | 1.0000000 | 0.458E+00<br>0.830E-02 |
| 283 | 132-0.50C0001-0.6000001 | 3.80144215 | 0.0025878 | -0.0024131 | 1.0000000 | 0.455E+00<br>0.461E-02 |
| 284 | 133-0.5CC0001-0.7000002 | 3.73713970 | 0.0046332 | -0.0005262 | 1.0000000 | 0.444E+00<br>0.511E-02 |
| 285 | 134-0.50C0001-0.8000002 | 3.66836357 | 0.0046262 | -0.0014655 | 1.0000000 | 0.448E+00<br>0.555E-02 |
| 286 | 136-0.60C0001-0.1000000 | 3.94261456 | 0.0020880 | 0.0002881 | 1.0000000 | 0.432E+00<br>0.358E-03 |
| 287 | 137-0.60C0001-0.2000000 | 3.92262459 | 0.0018329 | -0.0058342 | 1.0000000 | 0.547E+00<br>0.197E-01 |
| 288 | 138-0.60C0001-0.3000001 | 3.89187527 | 0.0048479 | -0.0047212 | 1.0000000 | 0.497E+00<br>0.144E-01 |
| 289 | 139-0.60C0001-0.4000001 | 3.85082912 | 0.0035105 | -0.0021466 | 1.0000000 | 0.460E+00<br>0.675E-02 |
| 290 | 140-0.60C0001-0.5000001 | 3.80144215 | 0.0022221 | -0.0025728 | 1.0000000 | 0.461E+00<br>0.581E-02 |
| 291 | 141-0.60C0001-0.6000001 | 3.74619007 | 0.0028422 | -0.0026136 | 1.0000000 | 0.456E+00<br>0.547E-02 |
| 292 | 142-0.60C0C01-0.7000002 | 3.68654537 | 0.0056022 | -0.0005915 | 1.0000000 | 0.446E+00<br>0.646E-02 |
| 293 | 143-0.60C0001-0.8000002 | 3.62175465 | 0.0012268 | 0.0016519 | 1.0000000 | 0.436E+00<br>-0.121E-04 |
| 294 | 145-0.70C0002-0.1000000 | 3.86242038 | 0.0032207 | -0.0042936 | 1.0000000 | 0.591E+00<br>0.341E-01 |
| 295 | 146-0.70C0002-0.2000000 | 3.84469414 | -0.0000638 | -0.0023152 | 1.0000000 | 0.481E+00<br>0.869E-02 |
| 296 | 147-0.70C0002-0.3000001 | 3.81779575 | 0.0036606 | -0.0040385 | 1.0000000 | 0.487E+00<br>0.132E-01 |
| 297 | 148-0.70C0002-0.4000001 | 3.78137112 | 0.0039424 | -0.0025558 | 1.0000000 | 0.463E+00<br>0.844E-02 |
| 298 | 149-0.70C0002-0.5000001 | 3.73713875 | 0.0045169 | -0.0024221 | 1.0000000 | 0.457E+00<br>0.752E-02 |
| 299 | 150-0.70C0002-0.6000001 | 3.68654537 | 0.0053916 | -0.0018466 | 1.0000000 | 0.451E+00<br>0.755E-02 |
| 300 | 151-0.70C0002-0.7000002 | 3.62852151 | 0.0039340 | -0.0053493 | 1.0000000 | 0.465E+00<br>0.440E-02 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 301 | 153-0.8000002-0.1000000 | 3.78136921 | 0.0027502 | -0.0046188 | 1.0000000 | 0.594E+00<br>0.406E-01 |
| 302 | 154-0.8000002-0.2000000 | 3.76594830 | 0.0019947 | -0.0048919 | 1.0000000 | 0.521E+00<br>0.218E-01 |
| 303 | 155-0.8000002-0.3000001 | 3.74140835 | 0.0021075 | -0.0046767 | 1.0000000 | 0.492E+00<br>0.147E-01 |
| 304 | 156-0.8000002-0.4000001 | 3.70886612 | 0.0042796 | -0.0047378 | 1.0000000 | 0.479E+00<br>0.138E-01 |
| 305 | 157-0.8000002-0.5000001 | 3.66835785 | 0.0040574 | -0.0041987 | 1.0000000 | 0.468E+00<br>0.108E-01 |
| 306 | 158-0.8000002-0.6000001 | 3.62175083 | 0.0016157 | 0.0012376 | 1.0000000 | 0.436E+00<br>-0.345E-04 |
| 307 | 160-0.9000002-0.1000000 | 3.69885540 | -0.0014205 | -0.0002509 | 1.0000000 | 0.450E+00<br>0.838E-03 |
| 308 | 161-0.9000002-0.2000000 | 3.68654060 | 0.0028115 | 0.0005708 | 1.0000000 | 0.433E+00<br>0.242E-03 |
| 309 | 162-0.9000002-0.3000001 | 3.66483307 | 0.0057648 | -0.0043888 | 1.0000000 | 0.487E+00<br>0.190E-01 |
| 310 | 163-0.9000002-0.4000001 | 3.63512611 | 0.0067769 | -0.0034063 | 1.0000000 | 0.468E+00<br>0.145E-01 |

END OF SKEW RAY TRACE.

TOTAL NUMBER OF RAYS TRACED = 310
TOTAL NUMBER OF PROPER IMAGE RAYS = 146
TOTAL NUMBER OF RAYS STRIKING IMAGE PLANE = 310

1 IMAGE PLANE SPOT DIAGRAM ANALYSIS:

THICKNESS =0.0500000 U =0.0 ALFAP =0.0 R =1.0000000

CENTROID: ZCENTR = 0.0, YCENTR = 0.0026398

STANDARD DEVIATIONS: SIGMAY = 0.0000121 SIGMAZ = 0.0000207

RMS SPOT SIZE: RMSRAD = 0.0057336

SPOT DIAGRAM ENERGY DENSITY VS. RADIUS FROM CENTROID:

| IZ4 | RADIUS | FRACTION |
|---|---|---|
| 1 | 0.0050000 | 0.6741935 |
| 2 | 0.0100000 | 0.9483871 |
| 3 | 0.0150000 | 0.9645161 |
| 4 | 0.0200000 | 0.9870967 |
| 5 | 0.0250000 | 1.0000000 |
| 6 | 0.0300000 | 1.0000000 |
| 7 | 0.0350000 | 1.0000000 |
| 8 | 0.0400000 | 1.0000000 |
| 9 | 0.0450000 | 1.0000000 |
| 10 | 0.0500000 | 1.0000000 |
| 11 | 0.0550000 | 1.0000000 |
| 12 | 0.0600000 | 1.0000000 |
| 13 | 0.0649999 | 1.0000000 |
| 14 | 0.0699999 | 1.0000000 |
| 15 | 0.0749999 | 1.0000000 |
| 16 | 0.0799999 | 1.0000000 |
| 17 | 0.0849999 | 1.0000000 |
| 18 | 0.0899999 | 1.0000000 |
| 19 | 0.0949999 | 1.0000000 |

| | | |
|---|---|---|
| 20 | 0.0999995 | 1.0000000 |
| 21 | 0.1049995 | 1.0000000 |
| 22 | 0.1099995 | 1.0000000 |
| 23 | 0.1149995 | 1.0000000 |
| 24 | 0.1199995 | 1.0000000 |
| 25 | 0.1249995 | 1.0000000 |
| 26 | 0.1299995 | 1.0000000 |
| 27 | 0.1349995 | 1.0000000 |
| 28 | 0.1399995 | 1.0000000 |
| 29 | 0.1449995 | 1.0000000 |
| 30 | 0.1499995 | 1.0000000 |
| 31 | 0.1549995 | 1.0000000 |
| 32 | 0.1599995 | 1.0000000 |
| 33 | 0.1649995 | 1.0000000 |
| 34 | 0.1699995 | 1.0000000 |
| 35 | 0.1749995 | 1.0000000 |
| 36 | 0.1799995 | 1.0000000 |
| 37 | 0.1849995 | 1.0000000 |
| 38 | 0.1899995 | 1.0000000 |
| 39 | 0.1949995 | 1.0000000 |
| 40 | 0.1999995 | 1.0000000 |
| 41 | 0.2049995 | 1.0000000 |
| 42 | 0.2099995 | 1.0000000 |
| 43 | 0.2149995 | 1.0000000 |
| 44 | 0.2199995 | 1.0000000 |
| 45 | 0.2249995 | 1.0000000 |
| 46 | 0.2299995 | 1.0000000 |
| 47 | 0.2349995 | 1.0000000 |
| 48 | 0.2399995 | 1.0000000 |
| 49 | 0.2449995 | 1.0000000 |
| 50 | 0.2499995 | 1.0000000 |
| 51 | 0.2549995 | 1.0000000 |
| 52 | 0.2599995 | 1.0000000 |
| 53 | 0.2649995 | 1.0000000 |
| 54 | 0.2699995 | 1.0000000 |
| 55 | 0.2749995 | 1.0000000 |
| 56 | 0.2799995 | 1.0000000 |
| 57 | 0.2849995 | 1.0000000 |
| 58 | 0.2899995 | 1.0000000 |
| 59 | 0.2949995 | 1.0000000 |
| 60 | 0.2999995 | 1.0000000 |
| 61 | 0.3049995 | 1.0000000 |
| 62 | 0.3099995 | 1.0000000 |
| 63 | 0.3149995 | 1.0000000 |
| 64 | 0.3199995 | 1.0000000 |
| 65 | 0.3249995 | 1.0000000 |
| 66 | 0.3299995 | 1.0000000 |
| 67 | 0.3349995 | 1.0000000 |
| 68 | 0.3399995 | 1.0000000 |
| 69 | 0.3449995 | 1.0000000 |
| 70 | 0.3499995 | 1.0000000 |
| 71 | 0.3549995 | 1.0000000 |
| 72 | 0.3599995 | 1.0000000 |
| 73 | 0.3649995 | 1.0000000 |
| 74 | 0.3699995 | 1.0000000 |
| 75 | 0.3749995 | 1.0000000 |
| 76 | 0.3799995 | 1.0000000 |
| 77 | 0.3849995 | 1.0000000 |
| 78 | 0.3899995 | 1.0000000 |
| 79 | 0.3949995 | 1.0000000 |
| 80 | 0.3999995 | 1.0000000 |
| 81 | 0.4049995 | 1.0000000 |
| 82 | 0.4099995 | 1.0000000 |
| 83 | 0.4149995 | 1.0000000 |
| 84 | 0.4199995 | 1.0000000 |
| 85 | 0.4249995 | 1.0000000 |
| 86 | 0.4299995 | 1.0000000 |
| 87 | 0.4349995 | 1.0000000 |
| 88 | 0.4399995 | 1.0000000 |
| 89 | 0.4449995 | 1.0000000 |
| 90 | 0.4499995 | 1.0000000 |
| 91 | 0.4549995 | 1.0000000 |

```
 S2   0.4599996   1.0000000
 S3   0.4649996   1.0000000
 S4   0.4699996   1.0000000
 S5   0.4749996   1.0000000
 S6   0.4799996   1.0000000
 S7   0.4849996   1.0000000
 S8   0.4899996   1.0000000
 S9   0.4949996   1.0000000
100   0.4599996   1.0000000
SPOT DIAGRAM CALCULATIONS COMPLETE.
TO OBTAIN PLOTS FROM THE PLOTTER OR THE PRINTER,
ISSUE THE FOLLOWING COMMAND:
        FOR PRINTER PLOTS          ENTER "LENSCOM PRINTER"
        FOR PLOTTER GRAPHS         ENTER "LENSCOM PLOTTER"
END OF PROGRAM
```

Best
Available
Copy

* GRIN PARAMETERS(2):

ALPHA = 0.7853979 BETA = 0.3222679 RADIUS = 1.00000 INCIDENT ANGLE = 0.0 ITERATIONS = 1008

EDGE THICKNESS = 0.0500000 INDICES OF REFRACTION: N1 = 1.00000 N2 = 1.50000 N3 = 1.00000

FOCAL LENGTH FROM STATION ZERO = 4.00000 DELTA BETA= 0.00032

CENTER OF SYM(XC)=-0.07000 CHANGE IN N2(I)= 0.0 ALFAP= 0.0

NOTE:X-COORDINATES HAS BEEN SHIFTED IN CASE=2 BY X2(K);NOW,X2(K)=0.0 ETC.

| J | X1 / E | Y1 / THETAE | X2 / THETAO | Y2 / PSI | BETA / PSIO | I2P / RP | I2 / RF | ETA | T | I1P | I1 | DYDXT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.0000000 | 1.0000000 | 1.0564194 | 0.9828857 | 0.3222679 | 0.0831530 | 0.0553998 | 0.2391149 | 0.0500000 | 0.4908826 | 0.7853981 | 4.1020784 |
| | 1.9013081 | 0.0341402 | 0.7174545 | 2.0954809 | 2.1296225 | 1.4949541 | 1.4645472 | | | | | |
| 2 | 0.9990687 | 0.9990683 | 1.0561848 | 0.9819179 | 0.3219482 | 0.0828245 | 0.0551812 | 0.2391236 | 0.0596354 | 0.4908826 | 0.7853981 | 4.1019230 |
| | 1.8995657 | 0.0344937 | 0.7170703 | 2.0955114 | 2.1302166 | 1.4941397 | 1.4632311 | | | | | |
| 3 | 0.9987671 | 0.9982667 | 1.0559492 | 0.9809508 | 0.3216285 | 0.0818918 | 0.0545605 | 0.2397367 | 0.0632251 | 0.4908826 | 0.7853981 | 4.0910225 |
| | 1.8980656 | 0.0348520 | 0.7166858 | 2.0955372 | 2.1306086 | 1.4933262 | 1.4620472 | | | | | |
| 4 | 0.9974731 | 0.9974727 | 1.0557117 | 0.9790845 | 0.3213087 | 0.0809220 | 0.0539193 | 0.2403867 | 0.0608078 | 0.4908826 | 0.7853981 | 4.0795240 |
| | 1.8965807 | 0.0352097 | 0.7163020 | 2.0955639 | 2.1309872 | 1.4925127 | 1.4609755 | | | | | |
| 5 | 0.9966730 | 0.9966726 | 1.0554752 | 0.9770174 | 0.3209890 | 0.0799776 | 0.0532468 | 0.2410114 | 0.0613955 | 0.4908826 | 0.7853981 | 4.0685310 |
| | 1.8950844 | 0.0355682 | 0.7159173 | 2.0955896 | 2.1313763 | 1.4916992 | 1.4598445 | | | | | |
| 6 | 0.9958795 | 0.9958791 | 1.0552368 | 0.9750511 | 0.3206693 | 0.0790104 | 0.0525931 | 0.2416589 | 0.0619768 | 0.4908826 | 0.7853981 | 4.0571966 |
| | 1.8935986 | 0.0359263 | 0.7155312 | 2.0956163 | 2.1317568 | 1.4908857 | 1.4587231 | | | | | |
| 7 | 0.9950880 | 0.9950796 | 1.0549984 | 0.9730846 | 0.3203496 | 0.0780447 | 0.0519163 | 0.2422839 | 0.0625631 | 0.4908826 | 0.7853981 | 4.0463629 |
| | 1.8921032 | 0.0362849 | 0.7151483 | 2.0956421 | 2.1321459 | 1.4900723 | 1.4575930 | | | | | |
| 8 | 0.9942871 | 0.9942867 | 1.0547609 | 0.9711187 | 0.3200299 | 0.0770758 | 0.0512388 | 0.2429341 | 0.0631440 | 0.4908826 | 0.7853981 | 4.0350447 |
| | 1.8906193 | 0.0366434 | 0.7147616 | 2.0956688 | 2.1325254 | 1.4892547 | 1.4564724 | | | | | |
| 9 | 0.9934917 | 0.9934913 | 1.0545225 | 0.9691527 | 0.3197102 | 0.0761042 | 0.0505589 | 0.2435760 | 0.0637264 | 0.4908826 | 0.7853981 | 4.0239792 |
| | 1.8891315 | 0.0370023 | 0.7143785 | 2.0956945 | 2.1329079 | 1.4884362 | 1.4553480 | | | | | |
| 10 | 0.9926957 | 0.9926953 | 1.0542822 | 0.9671876 | 0.3193905 | 0.0751761 | 0.0498925 | 0.2442124 | 0.0643073 | 0.4908826 | 0.7853981 | 4.0130653 |
| | 1.8876419 | 0.0373602 | 0.7139941 | 2.0957212 | 2.1332922 | 1.4876128 | 1.4542227 | | | | | |
| 11 | 0.9919010 | 0.9919006 | 1.0540469 | 0.9652223 | 0.3190708 | 0.0742047 | 0.0492445 | 0.2448561 | 0.0648864 | 0.4908826 | 0.7853981 | 4.0019140 |
| | 1.8861570 | 0.0377184 | 0.7136097 | 2.0957470 | 2.1336718 | 1.4867833 | 1.4531002 | | | | | |
| 12 | 0.9911039 | 0.9911035 | 1.0538106 | 0.9632571 | 0.3187510 | 0.0732571 | 0.0485964 | 0.2454939 | 0.0654680 | 0.4908826 | 0.7853981 | 3.9912586 |
| | 1.8846645 | 0.0380770 | 0.7132256 | 2.0957737 | 2.1340570 | 1.4859488 | 1.4519730 | | | | | |
| 13 | 0.9903088 | 0.9903084 | 1.0535693 | 0.9612923 | 0.3184313 | 0.0722950 | 0.0479482 | 0.2461364 | 0.0660472 | 0.4908826 | 0.7853981 | 3.9804087 |
| | 1.8831769 | 0.0384356 | 0.7128396 | 2.0958000 | 2.1344423 | 1.4851013 | 1.4508445 | | | | | |
| 14 | 0.9895176 | 0.9895172 | 1.0533152 | 0.9593287 | 0.3181117 | 0.0713329 | 0.0473194 | 0.2467988 | 0.0666207 | 0.4908826 | 0.7853981 | 3.9692822 |
| | 1.8816967 | 0.0387927 | 0.7124560 | 2.0958261 | 2.1348271 | 1.4842460 | 1.4497309 | | | | | |
| 15 | 0.9887178 | 0.9887174 | 1.0530771 | 0.9573643 | 0.3177919 | 0.0703739 | 0.0466929 | 0.2474210 | 0.0672011 | 0.4908826 | 0.7853981 | 3.9580814 |
| | 1.8802213 | 0.0391500 | 0.7120714 | 2.0958529 | 2.1352076 | 1.4833825 | 1.4486008 | | | | | |
| 16 | 0.9879227 | 0.9879223 | 1.0528259 | 0.9554011 | 0.3174722 | 0.0694059 | 0.0460679 | 0.2480693 | 0.0677754 | 0.4908826 | 0.7853981 | 3.9481001 |
| | 1.8787466 | 0.0395077 | 0.7116879 | 2.0958796 | 2.1355867 | 1.4824961 | 1.4474773 | | | | | |
| 17 | 0.9871269 | 0.9871264 | 1.0525799 | 0.9534380 | 0.3171525 | 0.0684434 | 0.0454091 | 0.2487091 | 0.0683487 | 0.4908826 | 0.7853981 | 3.9375124 |
| | 1.8772728 | 0.0398665 | 0.7113042 | 2.0959063 | 2.1359692 | 1.4816117 | 1.4463549 | | | | | |
| 18 | 0.9863335 | 0.9863331 | 1.0523349 | 0.9514747 | 0.3168328 | 0.0674851 | 0.0447532 | 0.2493477 | 0.0691259 | 0.4908826 | 0.7853981 | 3.9501171 |
| | 1.8758002 | 0.0402229 | 0.7109196 | 2.0959325 | 2.1363520 | 1.4807263 | 1.4452011 | | | | | |
| 19 | 0.9855297 | 0.9855292 | 1.0520887 | 0.9495115 | 0.3165131 | 0.0665283 | 0.0441000 | 0.2499548 | 0.0695041 | 0.4908826 | 0.7853981 | 3.9170551 |
| | 1.8743301 | 0.0405806 | 0.7105349 | 2.0959587 | 2.1367443 | 1.4798419 | 1.4440447 | | | | | |
| 20 | 0.9846482 | 0.9846474 | 1.0518446 | 0.9475483 | 0.3161934 | 0.0655661 | 0.0434422 | 0.2505722 | 0.0698727 | 0.4908826 | 0.7853981 | 3.9286509 |
| | 1.8727134 | 0.0409391 | 0.7101491 | 2.0959850 | 2.1371368 | 1.4789593 | 1.4428869 | | | | | |
| 21 | 0.9839361 | 0.9839357 | 1.0516014 | 0.9455841 | 0.3158737 | 0.0646033 | 0.0427836 | 0.2511864 | 0.0702596 | 0.4908826 | 0.7853981 | 3.8964739 |
| | 1.8712549 | 0.0412976 | 0.7097618 | 2.0960113 | 2.1375297 | 1.4780704 | 1.4417271 | | | | | |
| 22 | 0.9828650 | 0.9828646 | 1.0513554 | 0.9436197 | 0.3155540 | 0.0636397 | 0.0421243 | 0.2517986 | 0.0706462 | 0.4908826 | 0.7853981 | 3.8870702 |
| | 1.8697922 | 0.0416564 | 0.7093771 | 2.0960373 | 2.1379230 | 1.4771814 | 1.4405655 | | | | | |
| 23 | 0.9823527 | 0.9823523 | 1.0511074 | 0.9416591 | 0.3152342 | 0.0626760 | 0.0414645 | 0.2524085 | 0.0710312 | 0.4908826 | 0.7853981 | 3.8752670 |
| | 1.8682938 | 0.0420172 | 0.7089913 | 2.0960635 | 2.1383179 | 1.4762870 | 1.4394004 | | | | | |
| 24 | 0.9812877 | 0.9812855 | 1.0508605 | 0.9396971 | 0.3149145 | 0.0617114 | 0.0408037 | 0.2530132 | 0.0714137 | 0.4908826 | 0.7853981 | 3.8636144 |
| | 1.8667939 | 0.0423753 | 0.7086065 | 2.0960897 | 2.1387134 | 1.4753870 | 1.4382291 | | | | | |
| 25 | 0.9807576 | 0.9807569 | 1.0506135 | 0.9377352 | 0.3145948 | 0.0607466 | 0.0401424 | 0.2536127 | 0.0717944 | 0.4908826 | 0.7853981 | 3.8552666 |
| | 1.8653078 | 0.0427335 | 0.7082208 | 2.0961159 | 2.1391092 | 1.4744811 | 1.4371493 | | | | | |
| 26 | 0.9796953 | 0.9796949 | 1.0503616 | 0.9357733 | 0.3142751 | 0.0597798 | 0.0394805 | 0.2542031 | 0.0721693 | 0.4908826 | 0.7853981 | 3.8650150 |
| | 1.8638204 | 0.0430934 | 0.7078351 | 2.0961421 | 2.1395052 | 1.4735697 | 1.4360582 | | | | | |
| 27 | 0.9789778 | 0.9789774 | 1.0501117 | 0.9338112 | 0.3139554 | 0.0588089 | 0.0388145 | 0.2547865 | 0.0725379 | 0.4908826 | 0.7853981 | 3.8564692 |
| | 1.8623416 | 0.0434522 | 0.7074485 | 2.0961683 | 2.1399017 | 1.4726532 | 1.4349553 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 28 | 0.9780834 | 0.9780830 | 1.0498638 | 0.9560499 | 0.3136357 | 0.0592786 | 0.0395062 | 0.2543571 | 0.0748550 | 0.4908826 | 0.7853981 | 3.8463259 |
| | 1.8603048 | 0.0438012 | 0.7079628 | 2.0962114 | 2.1406651 | 1.4729748 | 1.4335699 | | | | | |
| 29 | 0.9772938 | 0.9772934 | 1.0496130 | 0.9558848 | 0.3133160 | 0.0582901 | 0.0388479 | 0.2550259 | 0.0754203 | 0.4908826 | 0.7853981 | 3.8357906 |
| | 1.8588285 | 0.0441597 | 0.7066771 | 2.0962381 | 2.1410408 | 1.4721603 | 1.4324541 | | | | | |
| 30 | 0.9764975 | 0.9764971 | 1.0493631 | 0.9549277 | 0.3129963 | 0.0573383 | 0.0382139 | 0.2556580 | 0.0759910 | 0.4908826 | 0.7853981 | 3.8258829 |
| | 1.8573380 | 0.0445191 | 0.7062906 | 2.0962658 | 2.1414289 | 1.4713459 | 1.4313288 | | | | | |
| 31 | 0.9757068 | 0.9757063 | 1.0491114 | 0.9539667 | 0.3126765 | 0.0564493 | 0.0375551 | 0.2563273 | 0.0765561 | 0.4908826 | 0.7853981 | 3.8154430 |
| | 1.8558548 | 0.0448781 | 0.7059045 | 2.0962925 | 2.1418047 | 1.4705305 | 1.4302111 | | | | | |
| 32 | 0.9749172 | 0.9749168 | 1.0488635 | 0.9530057 | 0.3123568 | 0.0555664 | 0.0369005 | 0.2569504 | 0.0771214 | 0.4908826 | 0.7853981 | 3.8051510 |
| | 1.8543816 | 0.0452379 | 0.7055176 | 2.0963202 | 2.1421833 | 1.4697170 | 1.4290953 | | | | | |
| 33 | 0.9741280 | 0.9741276 | 1.0486069 | 0.9520462 | 0.3120372 | 0.0546774 | 0.0362417 | 0.2576597 | 0.0776832 | 0.4908826 | 0.7853981 | 3.7948179 |
| | 1.8529053 | 0.0455961 | 0.7051324 | 2.0963469 | 2.1425581 | 1.4689016 | 1.4279795 | | | | | |
| 34 | 0.9733348 | 0.9733344 | 1.0483532 | 0.9510860 | 0.3117175 | 0.0537914 | 0.0355982 | 0.2583061 | 0.0782480 | 0.4908826 | 0.7853981 | 3.7848873 |
| | 1.8514214 | 0.0459550 | 0.7047463 | 2.0963745 | 2.1429405 | 1.4680862 | 1.4268589 | | | | | |
| 35 | 0.9725419 | 0.9725415 | 1.0480995 | 0.9501263 | 0.3113977 | 0.0529195 | 0.0349508 | 0.2589583 | 0.0788124 | 0.4908826 | 0.7853981 | 3.7749176 |
| | 1.8499384 | 0.0463139 | 0.7043601 | 2.0964012 | 2.1433220 | 1.4672709 | 1.4257383 | | | | | |
| 36 | 0.9717511 | 0.9717507 | 1.0478449 | 0.9491666 | 0.3110780 | 0.0519588 | 0.0342975 | 0.2596192 | 0.0793744 | 0.4908826 | 0.7853981 | 3.7648630 |
| | 1.8484583 | 0.0466730 | 0.7039738 | 2.0964283 | 2.1437016 | 1.4664555 | 1.4246206 | | | | | |
| 37 | 0.9709615 | 0.9709610 | 1.0475903 | 0.9482070 | 0.3107583 | 0.0509723 | 0.0336403 | 0.2602860 | 0.0799357 | 0.4908826 | 0.7853981 | 3.7547712 |
| | 1.8469820 | 0.0470322 | 0.7035872 | 2.0964556 | 2.1440843 | 1.4656410 | 1.4235048 | | | | | |
| 38 | 0.9701679 | 0.9701675 | 1.0473356 | 0.9472476 | 0.3104386 | 0.0499888 | 0.0329883 | 0.2609298 | 0.0804995 | 0.4908826 | 0.7853981 | 3.7450743 |
| | 1.8454971 | 0.0473919 | 0.7032002 | 2.0964832 | 2.1444535 | 1.4648266 | 1.4223824 | | | | | |
| 39 | 0.9693755 | 0.9693751 | 1.0470800 | 0.9462883 | 0.3101189 | 0.0489368 | 0.0323508 | 0.2615921 | 0.0810617 | 0.4908826 | 0.7853981 | 3.7352962 |
| | 1.8440142 | 0.0477513 | 0.7028133 | 2.0965109 | 2.1448450 | 1.4640112 | 1.4212627 | | | | | |
| 40 | 0.9685869 | 0.9685864 | 1.0468245 | 0.9453294 | 0.3097992 | 0.0478475 | 0.0316917 | 0.2622517 | 0.0816211 | 0.4908826 | 0.7853981 | 3.7253094 |
| | 1.8425379 | 0.0481111 | 0.7024261 | 2.0965385 | 2.1452217 | 1.4631958 | 1.4201479 | | | | | |
| 41 | 0.9677944 | 0.9677939 | 1.0465689 | 0.9443705 | 0.3094795 | 0.0468723 | 0.0310419 | 0.2629072 | 0.0821832 | 0.4908826 | 0.7853981 | 3.7155809 |
| | 1.8410568 | 0.0484712 | 0.7020385 | 2.0965652 | 2.1456041 | 1.4623814 | 1.4190263 | | | | | |
| 42 | 0.9670039 | 0.9670035 | 1.0463114 | 0.9434116 | 0.3091598 | 0.0458915 | 0.0303885 | 0.2635682 | 0.0827420 | 0.4908826 | 0.7853981 | 3.7058172 |
| | 1.8395777 | 0.0488308 | 0.7016514 | 2.0965929 | 2.1459837 | 1.4615660 | 1.4179105 | | | | | |
| 43 | 0.9662163 | 0.9662158 | 1.0460539 | 0.9424535 | 0.3088400 | 0.0449061 | 0.0297252 | 0.2642440 | 0.0832988 | 0.4908826 | 0.7853981 | 3.6958866 |
| | 1.8381042 | 0.0491905 | 0.7012642 | 2.0966206 | 2.1463585 | 1.4607506 | 1.4167876 | | | | | |
| 44 | 0.9654291 | 0.9654287 | 1.0457926 | 0.9414963 | 0.3085203 | 0.0439066 | 0.0290663 | 0.2649137 | 0.0838513 | 0.4908826 | 0.7853981 | 3.6860933 |
| | 1.8366308 | 0.0495485 | 0.7008788 | 2.0966482 | 2.1467333 | 1.4599342 | 1.4156647 | | | | | |
| 45 | 0.9646354 | 0.9646350 | 1.0455322 | 0.9405386 | 0.3082006 | 0.0429369 | 0.0284198 | 0.2655637 | 0.0844093 | 0.4908826 | 0.7853981 | 3.6766348 |
| | 1.8351603 | 0.0499074 | 0.7004922 | 2.0966759 | 2.1471157 | 1.4591169 | 1.4145632 | | | | | |
| 46 | 0.9638438 | 0.9638433 | 1.0452738 | 0.9395810 | 0.3078809 | 0.0418622 | 0.0277704 | 0.2662188 | 0.0849677 | 0.4908826 | 0.7853981 | 3.6671476 |
| | 1.8336858 | 0.0502674 | 0.7001044 | 2.0967035 | 2.1474981 | 1.4582925 | 1.4134445 | | | | | |
| 47 | 0.9630533 | 0.9630529 | 1.0450134 | 0.9386237 | 0.3075612 | 0.0408837 | 0.0271183 | 0.2668775 | 0.0855234 | 0.4908826 | 0.7853981 | 3.6576519 |
| | 1.8321867 | 0.0506269 | 0.6997172 | 2.0967312 | 2.1478786 | 1.4574871 | 1.4123268 | | | | | |
| 48 | 0.9622607 | 0.9622603 | 1.0447531 | 0.9376661 | 0.3072415 | 0.0397111 | 0.0264702 | 0.2675304 | 0.0860806 | 0.4908826 | 0.7853981 | 3.6482868 |
| | 1.8307047 | 0.0509869 | 0.6993294 | 2.0967588 | 2.1482611 | 1.4566708 | 1.4112072 | | | | | |
| 49 | 0.9614719 | 0.9614714 | 1.0444927 | 0.9367090 | 0.3069218 | 0.0387270 | 0.0258144 | 0.2681948 | 0.0866351 | 0.4908826 | 0.7853981 | 3.6388025 |
| | 1.8292284 | 0.0513471 | 0.6989414 | 2.0967865 | 2.1486406 | 1.4558563 | 1.4100924 | | | | | |
| 50 | 0.9606817 | 0.9606813 | 1.0442305 | 0.9357521 | 0.3066021 | 0.0377401 | 0.0251567 | 0.2688620 | 0.0871886 | 0.4908826 | 0.7853981 | 3.6293249 |
| | 1.8277502 | 0.0517067 | 0.6985539 | 2.0968151 | 2.1490192 | 1.4550430 | 1.4089755 | | | | | |
| 51 | 0.9598919 | 0.9598914 | 1.0439682 | 0.9347956 | 0.3062823 | 0.0367646 | 0.0245067 | 0.2695178 | 0.0877419 | 0.4908826 | 0.7853981 | 3.6200523 |
| | 1.8262711 | 0.0520665 | 0.6981663 | 2.0968428 | 2.1493997 | 1.4542236 | 1.4078588 | | | | | |
| 52 | 0.9590999 | 0.9590995 | 1.0437050 | 0.9338392 | 0.3059627 | 0.0357860 | 0.0238545 | 0.2701766 | 0.0882955 | 0.4908826 | 0.7853981 | 3.6107807 |
| | 1.8247910 | 0.0524263 | 0.6977786 | 2.0968704 | 2.1497822 | 1.4533973 | 1.4067402 | | | | | |
| 53 | 0.9583049 | 0.9583095 | 1.0434418 | 0.9328830 | 0.3056430 | 0.0348020 | 0.0231948 | 0.2708409 | 0.0888478 | 0.4908826 | 0.7853981 | 3.6014786 |
| | 1.8233128 | 0.0527864 | 0.6973905 | 2.0968981 | 2.1501617 | 1.4525909 | 1.4056234 | | | | | |
| 54 | 0.9575221 | 0.9575217 | 1.0431787 | 0.9319271 | 0.3053232 | 0.0338146 | 0.0225406 | 0.2715086 | 0.0893968 | 0.4908826 | 0.7853981 | 3.5921736 |
| | 1.8218384 | 0.0531457 | 0.6970031 | 2.0969267 | 2.1505394 | 1.4517846 | 1.4045192 | | | | | |
| 55 | 0.9567270 | 0.9567266 | 1.0429125 | 0.9309712 | 0.3050035 | 0.0328534 | 0.0218901 | 0.2721502 | 0.0899515 | 0.4908826 | 0.7853981 | 3.5832739 |
| | 1.8203516 | 0.0535058 | 0.6966149 | 2.0969543 | 2.1509266 | 1.4509583 | 1.4033861 | | | | | |
| 56 | 0.9559407 | 0.9559403 | 1.0426464 | 0.9300153 | 0.3046838 | 0.0318549 | 0.0212396 | 0.2728249 | 0.0904983 | 0.4908826 | 0.7853981 | 3.5739031 |
| | 1.8188801 | 0.0538654 | 0.6962273 | 2.0969830 | 2.1513004 | 1.4501416 | 1.4022751 | | | | | |
| 57 | 0.9551498 | 0.9551494 | 1.0423803 | 0.9290606 | 0.3043641 | 0.0308759 | 0.0205891 | 0.2734682 | 0.0910482 | 0.4908826 | 0.7853981 | 3.5648441 |
| | 1.8174019 | 0.0542251 | 0.6958393 | 2.0970116 | 2.1516819 | 1.4493246 | 1.4011574 | | | | | |
| 58 | 0.9543593 | 0.9543589 | 1.0421143 | 0.9281051 | 0.3040444 | 0.0298973 | 0.0199384 | 0.2741471 | 0.0915980 | 0.4908826 | 0.7853981 | 3.5558329 |
| | 1.8159218 | 0.0545855 | 0.6954513 | 2.0970397 | 2.1520643 | 1.4485083 | 1.4000417 | | | | | |
| 59 | 0.9535733 | 0.9535729 | 1.0418472 | 0.9271504 | 0.3037247 | 0.0289189 | 0.0192865 | 0.2748258 | 0.0921435 | 0.4908826 | 0.7853981 | 3.5465946 |
| | 1.8144512 | 0.0549455 | 0.6950626 | 2.0970669 | 2.1524491 | 1.4476919 | 1.3989286 | | | | | |
| 60 | 0.9527851 | 0.9527847 | 1.0415783 | 0.9261959 | 0.3034050 | 0.0279407 | 0.0186345 | 0.2754963 | 0.0926887 | 0.4908826 | 0.7853981 | 3.5375118 |
| | 1.8129759 | 0.0553048 | 0.6946751 | 2.0970955 | 2.1528358 | 1.4468737 | 1.3978148 | | | | | |
| 61 | 0.9519916 | 0.9519912 | 1.0413094 | 0.9252415 | 0.3030853 | 0.0269615 | 0.0179836 | 0.2761381 | 0.0932373 | 0.4908826 | 0.7853981 | 3.5286582 |
| | 1.8114910 | 0.0556645 | 0.6942871 | 2.0971241 | 2.1532250 | 1.4460564 | 1.3966432 | | | | | |
| 62 | 0.9511932 | 0.9511928 | 1.0410404 | 0.9242874 | 0.3027655 | 0.0259842 | 0.0173351 | 0.2767914 | 0.0937852 | 0.4908826 | 0.7853981 | 3.5200901 |
| | 1.8100090 | 0.0560244 | 0.6938987 | 2.0971527 | 2.1536164 | 1.4452391 | 1.3954735 | | | | | |
| 63 | 0.9504098 | 0.9504094 | 1.0407715 | 0.9233331 | 0.3024458 | 0.0249923 | 0.0166866 | 0.2774535 | 0.0943302 | 0.4908826 | 0.7853981 | 3.5112429 |
| | 1.8085327 | 0.0563844 | 0.6935104 | 2.0971804 | 2.1539669 | 1.4444218 | 1.3943078 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64 | 0.9496241 | 0.9496236 | 1.0405006 | 0.9223794 | 0.3021261 | 0.0239876 | 0.0159909 | 0.2781385 | 0.0948725 | 0.4908826 | 0.7853981 | 3.5021362 |
| | 1.8070631 | 0.0567445 | 0.6931218 | 2.0972090 | 2.1543407 | 1.4436045 | 1.3933477 | | | | | |
| 65 | 0.9488304 | 0.9488300 | 1.0402298 | 0.9214256 | 0.3018064 | 0.0230289 | 0.0153518 | 0.2787775 | 0.0954193 | 0.4908826 | 0.7853981 | 3.4936781 |
| | 1.8055773 | 0.0571066 | 0.6927332 | 2.0972376 | 2.1547289 | 1.4427872 | 1.3922453 | | | | | |
| 66 | 0.9480422 | 0.9480418 | 1.0399580 | 0.9204723 | 0.3014867 | 0.0220388 | 0.0146919 | 0.2794480 | 0.0959614 | 0.4908826 | 0.7853981 | 3.4848452 |
| | 1.8041029 | 0.0574665 | 0.6923448 | 2.0972662 | 2.1551065 | 1.4419689 | 1.3911114 | | | | | |
| 67 | 0.9472535 | 0.9472531 | 1.0396852 | 0.9195194 | 0.3011670 | 0.0210540 | 0.0140355 | 0.2801130 | 0.0965027 | 0.4908826 | 0.7853981 | 3.4761248 |
| | 1.8026266 | 0.0578241 | 0.6919566 | 2.0972948 | 2.1554861 | 1.4411507 | 1.3899965 | | | | | |
| 68 | 0.9464628 | 0.9464623 | 1.0394125 | 0.9185661 | 0.3008473 | 0.0200666 | 0.0133772 | 0.2807807 | 0.0970456 | 0.4908826 | 0.7853981 | 3.4674082 |
| | 1.8011494 | 0.0581841 | 0.6915679 | 2.0973234 | 2.1558657 | 1.4403324 | 1.3888798 | | | | | |
| 69 | 0.9456743 | 0.9456736 | 1.0391388 | 0.9176133 | 0.3005276 | 0.0190847 | 0.0127227 | 0.2814429 | 0.0975861 | 0.4908826 | 0.7853981 | 3.4588051 |
| | 1.7996731 | 0.0585440 | 0.6911794 | 2.0973520 | 2.1562462 | 1.4395142 | 1.3877649 | | | | | |
| 70 | 0.9448849 | 0.9448845 | 1.0388641 | 0.9166617 | 0.3002079 | 0.0180998 | 0.0120661 | 0.2821081 | 0.0981257 | 0.4908826 | 0.7853981 | 3.4502020 |
| | 1.7981958 | 0.0589037 | 0.6907911 | 2.0973806 | 2.1566267 | 1.4386959 | 1.3866491 | | | | | |
| 71 | 0.9440962 | 0.9440958 | 1.0385885 | 0.9157088 | 0.2998881 | 0.0171095 | 0.0114060 | 0.2827787 | 0.0986642 | 0.4908826 | 0.7853981 | 3.4415684 |
| | 1.7967215 | 0.0592632 | 0.6904028 | 2.0974092 | 2.1570044 | 1.4378767 | 1.3855352 | | | | | |
| 72 | 0.9433079 | 0.9433075 | 1.0383129 | 0.9147571 | 0.2995685 | 0.0161220 | 0.0107478 | 0.2834464 | 0.0992022 | 0.4908826 | 0.7853981 | 3.4330111 |
| | 1.7952471 | 0.0596229 | 0.6900143 | 2.0974379 | 2.1573830 | 1.4370584 | 1.3844206 | | | | | |
| 73 | 0.9425184 | 0.9425179 | 1.0380354 | 0.9138054 | 0.2992488 | 0.0151402 | 0.0100933 | 0.2841085 | 0.0997392 | 0.4908826 | 0.7853981 | 3.4245653 |
| | 1.7937689 | 0.0599821 | 0.6896263 | 2.0974674 | 2.1577635 | 1.4362383 | 1.3833046 | | | | | |
| 74 | 0.9417301 | 0.9417297 | 1.0377579 | 0.9128541 | 0.2989290 | 0.0141524 | 0.0094348 | 0.2847766 | 0.1002753 | 0.4908826 | 0.7853981 | 3.4160814 |
| | 1.7922945 | 0.0603415 | 0.6892380 | 2.0974960 | 2.1581421 | 1.4354191 | 1.3821907 | | | | | |
| 75 | 0.9409389 | 0.9409385 | 1.0374804 | 0.9119024 | 0.2986093 | 0.0131763 | 0.0087841 | 0.2854331 | 0.1008134 | 0.4908826 | 0.7853981 | 3.4077835 |
| | 1.7908134 | 0.0607015 | 0.6888493 | 2.0975246 | 2.1585255 | 1.4345999 | 1.3810720 | | | | | |
| 76 | 0.9401515 | 0.9401510 | 1.0372019 | 0.9109511 | 0.2982896 | 0.0121856 | 0.0081235 | 0.2861040 | 0.1013480 | 0.4908826 | 0.7853981 | 3.3993397 |
| | 1.7893400 | 0.0610613 | 0.6884603 | 2.0975542 | 2.1589041 | 1.4337807 | 1.3799591 | | | | | |
| 77 | 0.9393612 | 0.9393607 | 1.0369225 | 0.9100003 | 0.2979699 | 0.0112037 | 0.0074691 | 0.2867662 | 0.1018835 | 0.4908826 | 0.7853981 | 3.3910437 |
| | 1.7878618 | 0.0614207 | 0.6880718 | 2.0975828 | 2.1592846 | 1.4329605 | 1.3788424 | | | | | |
| 78 | 0.9385720 | 0.9385716 | 1.0366430 | 0.9090496 | 0.2976502 | 0.0102169 | 0.0068125 | 0.2874313 | 0.1024181 | 0.4908826 | 0.7853981 | 3.3827496 |
| | 1.7863865 | 0.0617804 | 0.6876830 | 2.0976124 | 2.1596651 | 1.4321413 | 1.3777215 | | | | | |
| 79 | 0.9377892 | 0.9377798 | 1.0363636 | 0.9080988 | 0.2973305 | 0.0092487 | 0.0061659 | 0.2880818 | 0.1029546 | 0.4908826 | 0.7853981 | 3.3746738 |
| | 1.7849045 | 0.0621407 | 0.6872935 | 2.0976419 | 2.1600504 | 1.4313221 | 1.3766079 | | | | | |
| 80 | 0.9369937 | 0.9369932 | 1.0360832 | 0.9071482 | 0.2970108 | 0.0082521 | 0.0055014 | 0.2887586 | 0.1034865 | 0.4908826 | 0.7853981 | 3.3663063 |
| | 1.7834330 | 0.0625004 | 0.6869043 | 2.0976706 | 2.1604271 | 1.4305019 | 1.3754969 | | | | | |
| 81 | 0.9362066 | 0.9362062 | 1.0358019 | 0.9061979 | 0.2966911 | 0.0072557 | 0.0048371 | 0.2894353 | 0.1040178 | 0.4908826 | 0.7853981 | 3.3579807 |
| | 1.7819614 | 0.0628607 | 0.6865152 | 2.0976992 | 2.1608038 | 1.4296818 | 1.3743839 | | | | | |
| 82 | 0.9354128 | 0.9354124 | 1.0355206 | 0.9052476 | 0.2963713 | 0.0062909 | 0.0041939 | 0.2900804 | 0.1045536 | 0.4908826 | 0.7853981 | 3.3500786 |
| | 1.7804766 | 0.0632210 | 0.6861255 | 2.0977287 | 2.1611819 | 1.4288626 | 1.3732624 | | | | | |
| 83 | 0.9346259 | 0.9346255 | 1.0352373 | 0.9042980 | 0.2960516 | 0.0052947 | 0.0035298 | 0.2907569 | 0.1050829 | 0.4908826 | 0.7853981 | 3.3418293 |
| | 1.7790041 | 0.0635807 | 0.6857366 | 2.0977583 | 2.1615646 | 1.4280415 | 1.3721504 | | | | | |
| 84 | 0.9338402 | 0.9338398 | 1.0349541 | 0.9033484 | 0.2957320 | 0.0042956 | 0.0028638 | 0.2914363 | 0.1056112 | 0.4908826 | 0.7853981 | 3.3335810 |
| | 1.7775345 | 0.0639406 | 0.6853473 | 2.0977879 | 2.1619444 | 1.4272213 | 1.3710403 | | | | | |
| 85 | 0.9330494 | 0.9330490 | 1.0346708 | 0.9023988 | 0.2954122 | 0.0032963 | 0.0021978 | 0.2920930 | 0.1061431 | 0.4908826 | 0.7853981 | 3.3256445 |
| | 1.7760553 | 0.0643009 | 0.6849576 | 2.0978165 | 2.1623278 | 1.4264011 | 1.3699226 | | | | | |
| 86 | 0.9322072 | 0.9322068 | 1.0343857 | 0.9014497 | 0.2950925 | 0.0023274 | 0.0015515 | 0.2915551 | 0.1066414 | 0.4908826 | 0.7853981 | 3.3320208 |
| | 1.7741641 | 0.0646510 | 0.6845686 | 2.0978456 | 2.1631060 | 1.4255800 | 1.3684492 | | | | | |
| 87 | 0.9314395 | 0.9314390 | 1.0341024 | 0.9005001 | 0.2947728 | 0.0014984 | 0.0009990 | 0.2932744 | 0.1072236 | 0.4908826 | 0.7853981 | 3.3114519 |
| | 1.7730427 | 0.0650204 | 0.6841779 | 2.0978745 | 2.1634843 | 1.4247599 | 1.3676472 | | | | | |
| 88 | 0.9306381 | 0.9306377 | 1.0338163 | 0.8995513 | 0.2944531 | 0.0005147 | 0.0001698 | 0.2929384 | 0.1078936 | 0.4908826 | 0.7853981 | 3.3154774 |
| | 1.7711697 | 0.0653723 | 0.6837865 | 2.0979147 | 2.1638646 | 1.4239388 | 1.3663319 | | | | | |
| 89 | 0.9298625 | 0.9298621 | 1.0335312 | 0.8986019 | 0.2941334 | -0.0004802 | -0.0003201 | 0.2946135 | 0.1082792 | 0.4908826 | 0.7853981 | 3.2954988 |
| | 1.7700930 | 0.0657413 | 0.6833980 | 2.0979557 | 2.1642389 | 1.4231176 | 1.3654184 | | | | | |
| 90 | 0.9288921 | 0.9288917 | 1.0332432 | 0.8976540 | 0.2938136 | -0.0014588 | -0.0009726 | 0.2944205 | 0.1089263 | 0.4908826 | 0.7853981 | 3.2977905 |
| | 1.7683762 | 0.0660937 | 0.6830091 | 2.0979729 | 2.1646170 | 1.4222965 | 1.3640471 | | | | | |
| 91 | 0.9280448 | 0.9280444 | 1.0329561 | 0.8967056 | 0.2934940 | -0.0024376 | -0.0016251 | 0.2948139 | 0.1094921 | 0.4908826 | 0.7853981 | 3.2931242 |
| | 1.7666912 | 0.0664518 | 0.6826187 | 2.0980033 | 2.1650391 | 1.4214745 | 1.3628492 | | | | | |
| 92 | 0.9272441 | 0.9272436 | 1.0326691 | 0.8957571 | 0.2931743 | -0.0034245 | -0.0022764 | 0.2954188 | 0.1100265 | 0.4908826 | 0.7853981 | 3.2859735 |
| | 1.7651930 | 0.0668122 | 0.6822284 | 2.0980344 | 2.1654636 | 1.4206543 | 1.3617172 | | | | | |
| 93 | 0.9264706 | 0.9264702 | 1.0323831 | 0.8948089 | 0.2928545 | -0.0044066 | -0.0029444 | 0.2960612 | 0.1105407 | 0.4908826 | 0.7853981 | 3.2772369 |
| | 1.7637463 | 0.0671730 | 0.6818384 | 2.0980644 | 2.1657863 | 1.4198322 | 1.3606243 | | | | | |
| 94 | 0.9256905 | 0.9256901 | 1.0320921 | 0.8938609 | 0.2925348 | -0.0053946 | -0.0035928 | 0.2966595 | 0.1110603 | 0.4908826 | 0.7853981 | 3.2689409 |
| | 1.7622871 | 0.0675344 | 0.6814476 | 2.0980930 | 2.1661044 | 1.4190111 | 1.3595219 | | | | | |
| 95 | 0.9249180 | 0.9249176 | 1.0318031 | 0.8929139 | 0.2922151 | -0.0063993 | -0.0042595 | 0.2972434 | 0.1115739 | 0.4908826 | 0.7853981 | 3.2602568 |
| | 1.7608433 | 0.0678958 | 0.6810568 | 2.0981226 | 2.1665201 | 1.4181903 | 1.3584309 | | | | | |
| 96 | 0.9241395 | 0.9241391 | 1.0315142 | 0.8919650 | 0.2918954 | -0.0074124 | -0.0049416 | 0.2978258 | 0.1120914 | 0.4908826 | 0.7853981 | 3.2519732 |
| | 1.7593861 | 0.0682576 | 0.6806656 | 2.0981522 | 2.1668363 | 1.4173679 | 1.3573305 | | | | | |
| 97 | 0.9233772 | 0.9233768 | 1.0312233 | 0.8910177 | 0.2915757 | -0.0084405 | -0.0056269 | 0.2983163 | 0.1125961 | 0.4908826 | 0.7853981 | 3.2428761 |
| | 1.7579594 | 0.0686190 | 0.6802751 | 2.0981817 | 2.1672508 | 1.4165459 | 1.3562027 | | | | | |
| 98 | 0.9226059 | 0.9226055 | 1.0309324 | 0.8900704 | 0.2912560 | -0.0094866 | -0.0063244 | 0.2988040 | 0.1131069 | 0.4908826 | 0.7853981 | 3.2342777 |
| | 1.7565165 | 0.0689806 | 0.6798848 | 2.0982103 | 2.1675616 | 1.4157248 | 1.3550826 | | | | | |
| 99 | 0.9218428 | 0.9218424 | 1.0306436 | 0.8891236 | 0.2909363 | -0.0105471 | -0.0070314 | 0.2992956 | 0.1136131 | 0.4908826 | 0.7853981 | 3.2252398 |
| | 1.7550888 | 0.0693417 | 0.6794939 | 2.0982389 | 2.1679220 | 1.4149037 | 1.3539625 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 0.9210676 | 0.9210672 | 1.0303469 | 0.8881770 | 0.2906166 | -0.0107699 | -0.0071799 | 0.3013865 | 0.1141216 | 0.4908826 | 0.7853981 | 3.2169228 |
| | 1.7536392 | 0.0697028 | 0.6791033 | 2.0982695 | 2.1682816 | 1.4140787 | 1.3529492 | | | | | |
| 101 | 0.9203022 | 0.9203018 | 1.0310531 | 0.8872305 | 0.2902969 | -0.0118634 | -0.0079088 | 0.3021603 | 0.1146254 | 0.4908826 | 0.7853981 | 3.2081633 |
| | 1.7522058 | 0.0700640 | 0.6787127 | 2.0982990 | 2.1686277 | 1.4132557 | 1.3519068 | | | | | |
| 102 | 0.9195278 | 0.9195274 | 1.0297585 | 0.8862839 | 0.2899771 | -0.0129198 | -0.0086130 | 0.3028969 | 0.1151344 | 0.4908826 | 0.7853981 | 3.1998644 |
| | 1.7507582 | 0.0704251 | 0.6781220 | 2.0983286 | 2.1689854 | 1.4124327 | 1.3508129 | | | | | |
| 103 | 0.9185042 | 0.9185038 | 1.0294647 | 0.8853375 | 0.2896574 | -0.0128032 | -0.0085323 | 0.3024576 | 0.1158112 | 0.4908826 | 0.7853981 | 3.2048082 |
| | 1.7488432 | 0.0707772 | 0.6779305 | 2.0983677 | 2.1693769 | 1.4116106 | 1.3493662 | | | | | |
| 104 | 0.9178941 | 0.9178937 | 1.0291700 | 0.8843914 | 0.2893378 | -0.0146260 | -0.0097504 | 0.3039637 | 0.1162098 | 0.4908826 | 0.7853981 | 3.1879148 |
| | 1.7477016 | 0.0711451 | 0.6775392 | 2.0983915 | 2.1698389 | 1.4107876 | 1.3485341 | | | | | |
| 105 | 0.9169879 | 0.9169875 | 1.0288734 | 0.8834458 | 0.2890180 | -0.0150614 | -0.0100407 | 0.3040795 | 0.1168050 | 0.4908826 | 0.7853981 | 3.1866236 |
| | 1.7460070 | 0.0715008 | 0.6771485 | 2.0984259 | 2.1704044 | 1.4099636 | 1.3472233 | | | | | |
| 106 | 0.9161142 | 0.9161138 | 1.0285769 | 0.8824999 | 0.2886983 | -0.0156456 | -0.0104301 | 0.3043439 | 0.1173786 | 0.4908826 | 0.7853981 | 3.1836758 |
| | 1.7443714 | 0.0718583 | 0.6767573 | 2.0984602 | 2.1709204 | 1.4091406 | 1.3459883 | | | | | |
| 107 | 0.9155551 | 0.9155546 | 1.0282803 | 0.8815541 | 0.2883786 | -0.0177148 | -0.0118095 | 0.3060934 | 0.1177413 | 0.4908826 | 0.7853981 | 3.1643019 |
| | 1.7433252 | 0.0722285 | 0.6763655 | 2.0984812 | 2.1709423 | 1.4083166 | 1.3451977 | | | | | |
| 108 | 0.9147711 | 0.9147707 | 1.0279827 | 0.8806087 | 0.2880589 | -0.0167252 | -0.0124831 | 0.3067841 | 0.1182536 | 0.4908826 | 0.7853981 | 3.1567116 |
| | 1.7418594 | 0.0725896 | 0.6759741 | 2.0985117 | 2.1713161 | 1.4074926 | 1.3440905 | | | | | |
| 109 | 0.9140377 | 0.9140373 | 1.0276842 | 0.8796633 | 0.2877392 | -0.0199731 | -0.0133149 | 0.3077123 | 0.1187311 | 0.4908826 | 0.7853981 | 3.1465645 |
| | 1.7404871 | 0.0729526 | 0.6755826 | 2.0985403 | 2.1716118 | 1.4066687 | 1.3429525 | | | | | |
| 110 | 0.9133577 | 0.9133573 | 1.0273848 | 0.8787187 | 0.2874195 | -0.0214667 | -0.0143135 | 0.3086862 | 0.1191721 | 0.4908826 | 0.7853981 | 3.1338148 |
| | 1.7392139 | 0.0733173 | 0.6751915 | 2.0985670 | 2.1718265 | 1.4058447 | 1.3420925 | | | | | |
| 111 | 0.9127256 | 0.9127252 | 1.0270844 | 0.8777741 | 0.2870998 | -0.0231692 | -0.0154587 | 0.3102850 | 0.1195805 | 0.4908826 | 0.7853981 | 3.1187019 |
| | 1.7380314 | 0.0736839 | 0.6748003 | 2.0985909 | 2.1719608 | 1.4050198 | 1.3411949 | | | | | |
| 112 | 0.9118803 | 0.9118798 | 1.0267820 | 0.8768299 | 0.2867801 | -0.0239164 | -0.0159434 | 0.3106965 | 0.1201288 | 0.4908826 | 0.7853981 | 3.1143370 |
| | 1.7364511 | 0.0740415 | 0.6744097 | 2.0986242 | 2.1724291 | 1.4041939 | 1.3400349 | | | | | |
| 113 | 0.9110806 | 0.9110802 | 1.0264797 | 0.8758860 | 0.2864603 | -0.0248497 | -0.0165665 | 0.3113100 | 0.1206465 | 0.4908826 | 0.7853981 | 3.1077852 |
| | 1.7349548 | 0.0744010 | 0.6740190 | 2.0986557 | 2.1728277 | 1.4033680 | 1.3386748 | | | | | |
| 114 | 0.9102969 | 0.9102965 | 1.0261765 | 0.8749419 | 0.2861406 | -0.0258599 | -0.0172389 | 0.3120005 | 0.1211528 | 0.4908826 | 0.7853981 | 3.1004410 |
| | 1.7334881 | 0.0747615 | 0.6736280 | 2.0986862 | 2.1732016 | 1.4025421 | 1.3372666 | | | | | |
| 115 | 0.9095206 | 0.9095201 | 1.0258732 | 0.8739982 | 0.2858209 | -0.0269075 | -0.0179372 | 0.3127284 | 0.1216542 | 0.4908826 | 0.7853981 | 3.0927334 |
| | 1.7320356 | 0.0751224 | 0.6732367 | 2.0987167 | 2.1735640 | 1.4017162 | 1.3366699 | | | | | |
| 116 | 0.9087515 | 0.9087511 | 1.0255690 | 0.8730549 | 0.2855012 | -0.0279861 | -0.0186561 | 0.3134874 | 0.1221496 | 0.4908826 | 0.7853981 | 3.0847330 |
| | 1.7305975 | 0.0754832 | 0.6728457 | 2.0987463 | 2.1739149 | 1.4008904 | 1.3355827 | | | | | |
| 117 | 0.9079807 | 0.9079803 | 1.0252638 | 0.8721113 | 0.2851815 | -0.0290620 | -0.0193732 | 0.3142436 | 0.1226454 | 0.4908826 | 0.7853981 | 3.0768013 |
| | 1.7291555 | 0.0758442 | 0.6724545 | 2.0987768 | 2.1742668 | 1.4000635 | 1.3344936 | | | | | |
| 118 | 0.9072080 | 0.9072075 | 1.0249586 | 0.8711680 | 0.2848618 | -0.0301208 | -0.0200788 | 0.3149826 | 0.1231424 | 0.4908826 | 0.7853981 | 3.0690832 |
| | 1.7277098 | 0.0762053 | 0.6720629 | 2.0988073 | 2.1746294 | 1.3992376 | 1.3334017 | | | | | |
| 119 | 0.9064395 | 0.9064391 | 1.0246575 | 0.8702250 | 0.2845421 | -0.0312025 | -0.0207998 | 0.3157446 | 0.1236356 | 0.4908826 | 0.7853981 | 3.0611620 |
| | 1.7262716 | 0.0765664 | 0.6716716 | 2.0988379 | 2.1749754 | 1.3984108 | 1.3323154 | | | | | |
| 120 | 0.9056753 | 0.9056749 | 1.0243444 | 0.8692823 | 0.2842224 | -0.0323098 | -0.0215378 | 0.3165321 | 0.1241241 | 0.4908826 | 0.7853981 | 3.0530138 |
| | 1.7248430 | 0.0769271 | 0.6712807 | 2.0988674 | 2.1753160 | 1.3975840 | 1.3312359 | | | | | |
| 121 | 0.9048987 | 0.9048983 | 1.0240374 | 0.8683397 | 0.2839026 | -0.0333513 | -0.0222319 | 0.3172539 | 0.1246216 | 0.4908826 | 0.7853981 | 3.0455809 |
| | 1.7233896 | 0.0772883 | 0.6708889 | 2.0988979 | 2.1756811 | 1.3967571 | 1.3301382 | | | | | |
| 122 | 0.9041256 | 0.9041252 | 1.0237293 | 0.8673967 | 0.2835829 | -0.0344127 | -0.0229393 | 0.3179956 | 0.1251161 | 0.4908826 | 0.7853981 | 3.0379763 |
| | 1.7219429 | 0.0776495 | 0.6704971 | 2.0989285 | 2.1760378 | 1.3959293 | 1.3290453 | | | | | |
| 123 | 0.9033605 | 0.9033601 | 1.0234203 | 0.8664547 | 0.2832633 | -0.0355111 | -0.0236713 | 0.3187744 | 0.1256040 | 0.4908826 | 0.7853981 | 3.0300293 |
| | 1.7205114 | 0.0780104 | 0.6701057 | 2.0989590 | 2.1763830 | 1.3951025 | 1.3279638 | | | | | |
| 124 | 0.9023332 | 0.9023329 | 1.0231104 | 0.8655128 | 0.2829435 | -0.0363746 | -0.0245863 | 0.3183181 | 0.1262649 | 0.4908826 | 0.7853981 | 3.0346813 |
| | 1.7185898 | 0.0783611 | 0.6697142 | 2.0990003 | 2.1771343 | 1.3942747 | 1.3265123 | | | | | |
| 125 | 0.9017286 | 0.9017282 | 1.0228004 | 0.8645704 | 0.2826238 | -0.0372282 | -0.0248157 | 0.3198521 | 0.1266455 | 0.4908826 | 0.7853981 | 3.0190935 |
| | 1.7174587 | 0.0787290 | 0.6693221 | 2.0990238 | 2.1772327 | 1.3934469 | 1.3256578 | | | | | |
| 126 | 0.9007460 | 0.9007456 | 1.0224905 | 0.8636283 | 0.2823041 | -0.0373057 | -0.0248672 | 0.3196098 | 0.1272769 | 0.4908826 | 0.7853981 | 3.0215454 |
| | 1.7156200 | 0.0790824 | 0.6689297 | 2.0990629 | 2.1779194 | 1.3926191 | 1.3242693 | | | | | |
| 127 | 0.9001682 | 0.9001674 | 1.0221796 | 0.8626863 | 0.2819844 | -0.0392847 | -0.0261863 | 0.3212691 | 0.1276387 | 0.4908826 | 0.7853981 | 3.0048208 |
| | 1.7145395 | 0.0794517 | 0.6685373 | 2.0990868 | 2.1779709 | 1.3917913 | 1.3234525 | | | | | |
| 128 | 0.8991715 | 0.8991711 | 1.0218678 | 0.8617448 | 0.2816647 | -0.0392996 | -0.0261955 | 0.3209643 | 0.1282774 | 0.4908826 | 0.7853981 | 3.0078802 |
| | 1.7126760 | 0.0798041 | 0.6681451 | 2.0991259 | 2.1786785 | 1.3909626 | 1.3220644 | | | | | |
| 129 | 0.8983552 | 0.8983548 | 1.0215569 | 0.8608033 | 0.2813450 | -0.0401551 | -0.0267661 | 0.3215301 | 0.1287975 | 0.4908826 | 0.7853981 | 3.0025053 |
| | 1.7111473 | 0.0801646 | 0.6677518 | 2.0991592 | 2.1791058 | 1.3901348 | 1.3208764 | | | | | |
| 130 | 0.8975670 | 0.8975666 | 1.0212461 | 0.8598619 | 0.2810253 | -0.0411449 | -0.0274257 | 0.3221702 | 0.1292958 | 0.4908826 | 0.7853981 | 2.9958076 |
| | 1.7096729 | 0.0805259 | 0.6673598 | 2.0991907 | 2.1794872 | 1.3893061 | 1.3197765 | | | | | |
| 131 | 0.8967773 | 0.8967769 | 1.0209353 | 0.8589208 | 0.2807056 | -0.0421256 | -0.0280771 | 0.3228312 | 0.1297962 | 0.4908826 | 0.7853981 | 2.9892282 |
| | 1.7081957 | 0.0808862 | 0.6669667 | 2.0992222 | 2.1798725 | 1.3884783 | 1.3186607 | | | | | |
| 132 | 0.8959895 | 0.8959891 | 1.0206156 | 0.8579795 | 0.2803859 | -0.0431214 | -0.0287427 | 0.3235572 | 0.1302935 | 0.4908826 | 0.7853981 | 2.9825239 |
| | 1.7067213 | 0.0812471 | 0.6665741 | 2.0992546 | 2.1802530 | 1.3876486 | 1.3175408 | | | | | |
| 133 | 0.8951993 | 0.8951989 | 1.0203009 | 0.8570384 | 0.2800661 | -0.0441050 | -0.0293980 | 0.3241711 | 0.1307923 | 0.4908826 | 0.7853981 | 2.9759684 |
| | 1.7052441 | 0.0816082 | 0.6661811 | 2.0992861 | 2.1806374 | 1.3868198 | 1.3164313 | | | | | |
| 134 | 0.8944097 | 0.8944092 | 1.0199862 | 0.8560977 | 0.2797464 | -0.0450860 | -0.0300516 | 0.3248324 | 0.1312906 | 0.4908826 | 0.7853981 | 2.9694624 |
| | 1.7037659 | 0.0819696 | 0.6657878 | 2.0993176 | 2.1810226 | 1.3859911 | 1.3153143 | | | | | |
| 135 | 0.8936242 | 0.8936238 | 1.0196705 | 0.8551570 | 0.2794267 | -0.0460670 | -0.0307165 | 0.3255137 | 0.1317853 | 0.4908826 | 0.7853981 | 2.9627886 |
| | 1.7022951 | 0.0823311 | 0.6653945 | 2.0993500 | 2.1814022 | 1.3851624 | 1.3141942 | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 136 | 0.8928342 | 0.8928338 | 1.0193539 | 0.8542167 | 0.2791070-0.0470731-0.0313756 | 0.3261802 | 0.1322819 | 0.4908826 | 0.7853981 | 2.9562845 |
| | 1.7008190 | 0.0826922 | 0.6650014 | 2.0993814 | 2.1817856 1.3843327 1.3130884 | | | | | |
| 137 | 0.8920417 | 0.8920413 | 1.0190372 | 0.8532760 | 0.2787873-0.0480428-0.0320217 | 0.3268301 | 0.1327803 | 0.4908826 | 0.7853981 | 2.9499664 |
| | 1.6993361 | 0.0830539 | 0.6646075 | 2.0994139 | 2.1821756 1.3835030 1.3119678 | | | | | |
| 138 | 0.8912580 | 0.8912576 | 1.0187197 | 0.8523359 | 0.2784676-0.0490549-0.0326963 | 0.3275225 | 0.1332718 | 0.4908826 | 0.7853981 | 2.9432611 |
| | 1.6978693 | 0.0834154 | 0.6642140 | 2.0994463 | 2.1825514 1.3826733 1.3108606 | | | | | |
| 139 | 0.8904667 | 0.8904663 | 1.0184021 | 0.8513956 | 0.2781479-0.0500326-0.0333473 | 0.3281805 | 0.1337683 | 0.4908826 | 0.7853981 | 2.9369164 |
| | 1.6963892 | 0.0837774 | 0.6638198 | 2.0994778 | 2.1829386 1.3818436 1.3097420 | | | | | |
| 140 | 0.8896797 | 0.8896793 | 1.0180836 | 0.8504553 | 0.2778282-0.0510276-0.0340102 | 0.3288558 | 0.1342612 | 0.4908826 | 0.7853981 | 2.9304295 |
| | 1.6949167 | 0.0841393 | 0.6634257 | 2.0995102 | 2.1833200 1.3810139 1.3086303 | | | | | |
| 141 | 0.8889949 | 0.8889935 | 1.0177631 | 0.8495159 | 0.2775084-0.0520340-0.0346807 | 0.3295425 | 0.1347511 | 0.4908826 | 0.7853981 | 2.9238586 |
| | 1.6934471 | 0.0845005 | 0.6630324 | 2.0995426 | 2.1836977 1.3801832 1.3075179 | | | | | |
| 142 | 0.8881058 | 0.8881053 | 1.0174427 | 0.8485767 | 0.2771888-0.0530257-0.0353412 | 0.3302144 | 0.1352426 | 0.4908826 | 0.7853981 | 2.9174547 |
| | 1.6919727 | 0.0848619 | 0.6626387 | 2.0995750 | 2.1840801 1.3793526 1.3064060 | | | | | |
| 143 | 0.8873146 | 0.8873141 | 1.0171213 | 0.8476372 | 0.2768691-0.0540034-0.0359926 | 0.3308725 | 0.1357352 | 0.4908826 | 0.7853981 | 2.9112072 |
| | 1.6904926 | 0.0852233 | 0.6622449 | 2.0996075 | 2.1844664 1.3785210 1.3052983 | | | | | |
| 144 | 0.8865239 | 0.8865235 | 1.0167999 | 0.8466978 | 0.2765493-0.0549839-0.0366457 | 0.3315332 | 0.1362275 | 0.4908826 | 0.7853981 | 2.9049587 |
| | 1.6890135 | 0.0855851 | 0.6618506 | 2.0996399 | 2.1848536 1.3776903 1.3041706 | | | | | |
| 145 | 0.8857331 | 0.8857327 | 1.0164785 | 0.8457583 | 0.2762296-0.0559670-0.0373005 | 0.3321966 | 0.1367198 | 0.4908826 | 0.7853981 | 2.8987103 |
| | 1.6875343 | 0.0859473 | 0.6614558 | 2.0996723 | 2.1852398 1.3768587 1.3030529 | | | | | |
| 146 | 0.8849465 | 0.8849461 | 1.0161562 | 0.8448192 | 0.2759099-0.0569645-0.0379649 | 0.3328744 | 0.1372084 | 0.4908826 | 0.7853981 | 2.8923492 |
| | 1.6860619 | 0.0863096 | 0.6610610 | 2.0997047 | 2.1856213 1.3760281 1.3019409 | | | | | |
| 147 | 0.8841598 | 0.8841594 | 1.0158329 | 0.8438802 | 0.2755902-0.0579546-0.0386313 | 0.3335548 | 0.1376961 | 0.4908826 | 0.7853981 | 2.8859892 |
| | 1.6845903 | 0.0866717 | 0.6606664 | 2.0997372 | 2.1860018 1.3751965 1.3008789 | | | | | |
| 148 | 0.8833729 | 0.8833725 | 1.0155087 | 0.8429417 | 0.2752705-0.0589590-0.0392933 | 0.3342295 | 0.1381829 | 0.4908826 | 0.7853981 | 2.8797064 |
| | 1.6831179 | 0.0870335 | 0.6602721 | 2.0997696 | 2.1863832 1.3743649 1.2997169 | | | | | |
| 149 | 0.8825823 | 0.8825819 | 1.0151834 | 0.8420035 | 0.2749508-0.0599447-0.0399498 | 0.3348955 | 0.1386711 | 0.4908826 | 0.7853981 | 2.8735294 |
| | 1.6816367 | 0.0873950 | 0.6598778 | 2.0998030 | 2.1867685 1.3735323 1.2986002 | | | | | |
| 150 | 0.8817908 | 0.8817904 | 1.0148582 | 0.8410646 | 0.2746311-0.0609218-0.0406005 | 0.3355529 | 0.1391600 | 0.4908826 | 0.7853981 | 2.8674545 |
| | 1.6801586 | 0.0877572 | 0.6594826 | 2.0998354 | 2.1871567 1.3726997 1.2974615 | | | | | |
| 151 | 0.8810013 | 0.8810009 | 1.0145321 | 0.8401262 | 0.2743114-0.0619079-0.0412574 | 0.3362193 | 0.1396467 | 0.4908826 | 0.7853981 | 2.8613214 |
| | 1.6786804 | 0.0881194 | 0.6590877 | 2.0998688 | 2.1875420 1.3718672 1.2963657 | | | | | |
| 152 | 0.8802161 | 0.8802156 | 1.0142050 | 0.8391882 | 0.2739916-0.0628761-0.0419206 | 0.3369077 | 0.1401295 | 0.4908826 | 0.7853981 | 2.8550091 |
| | 1.6771427 | 0.0884814 | 0.6586928 | 2.0999012 | 2.1879276 1.3710346 1.2952565 | | | | | |
| 153 | 0.8794284 | 0.8794280 | 1.0138779 | 0.8382501 | 0.2736719-0.0638133-0.0425928 | 0.3375852 | 0.1406139 | 0.4908826 | 0.7853981 | 2.8488216 |
| | 1.6757402 | 0.0888437 | 0.6582976 | 2.0999336 | 2.1883111 1.3702021 1.2941437 | | | | | |
| 154 | 0.8786372 | 0.8786368 | 1.0135498 | 0.8373122 | 0.2733522-0.0647491-0.0432452 | 0.3382453 | 0.1410997 | 0.4908826 | 0.7853981 | 2.8428164 |
| | 1.6742582 | 0.0892053 | 0.6579023 | 2.0999670 | 2.1886892 1.3693686 1.2930250 | | | | | |
| 155 | 0.8778494 | 0.8778490 | 1.0132208 | 0.8363748 | 0.2730325-0.0656867-0.0438967 | 0.3389192 | 0.1415822 | 0.4908826 | 0.7853981 | 2.8367071 |
| | 1.6727848 | 0.0895679 | 0.6575074 | 2.1000004 | 2.1890717 1.3685350 1.2919121 | | | | | |
| 156 | 0.8770599 | 0.8770595 | 1.0128938 | 0.8354372 | 0.2727128-0.0666156-0.0445649 | 0.3395879 | 0.1420649 | 0.4908826 | 0.7853981 | 2.8306694 |
| | 1.6713085 | 0.0899299 | 0.6571122 | 2.1000338 | 2.1894560 1.3677015 1.2907853 | | | | | |
| 157 | 0.8762698 | 0.8762694 | 1.0125668 | 0.8344997 | 0.2723931-0.0675302-0.0452208 | 0.3402533 | 0.1425490 | 0.4908826 | 0.7853981 | 2.8246841 |
| | 1.6698294 | 0.0902926 | 0.6567162 | 2.1000662 | 2.1898432 1.3668680 1.2896725 | | | | | |
| 158 | 0.8754831 | 0.8754827 | 1.0122339 | 0.8335626 | 0.2720734-0.0684358-0.0458866 | 0.3409302 | 0.1430289 | 0.4908826 | 0.7853981 | 2.8186169 |
| | 1.6683569 | 0.0906549 | 0.6563209 | 2.1000996 | 2.1902246 1.3660336 1.2885675 | | | | | |
| 159 | 0.8746927 | 0.8746923 | 1.0119099 | 0.8326253 | 0.2717537-0.0693419-0.0465401 | 0.3415955 | 0.1435112 | 0.4908826 | 0.7853981 | 2.8126774 |
| | 1.6668787 | 0.0910175 | 0.6559248 | 2.1001329 | 2.1906118 1.3651990 1.2874584 | | | | | |
| 160 | 0.8739043 | 0.8739039 | 1.0115841 | 0.8316882 | 0.2714339-0.0702385-0.0472337 | 0.3422725 | 0.1439912 | 0.4908826 | 0.7853981 | 2.8066559 |
| | 1.6654043 | 0.0913801 | 0.6555289 | 2.1001663 | 2.1909943 1.3643636 1.2863469 | | | | | |
| 161 | 0.8731133 | 0.8731126 | 1.0112552 | 0.8307514 | 0.2711143-0.0711176-0.0478255 | 0.3429319 | 0.1444722 | 0.4908826 | 0.7853981 | 2.8008137 |
| | 1.6639233 | 0.0917426 | 0.6551330 | 2.1001997 | 2.1913824 1.3635282 1.2852182 | | | | | |
| 162 | 0.8723247 | 0.8723233 | 1.0109024 | 0.8298146 | 0.2707946-0.0720055-0.0484132 | 0.3436001 | 0.1449519 | 0.4908826 | 0.7853981 | 2.7949142 |
| | 1.6624479 | 0.0921054 | 0.6547366 | 2.1002331 | 2.1917677 1.3626926 1.2841034 | | | | | |
| 163 | 0.8715358 | 0.8715354 | 1.0105806 | 0.8288780 | 0.2704749-0.0728816-0.0489962 | 0.3442764 | 0.1454296 | 0.4908826 | 0.7853981 | 2.7889662 |
| | 1.6609735 | 0.0924681 | 0.6543405 | 2.1002665 | 2.1921511 1.3618612 1.2829693 | | | | | |
| 164 | 0.8705091 | 0.8705087 | 1.0102339 | 0.8279412 | 0.2701551-0.0736740-0.0495713 | 0.3438291 | 0.1460051 | 0.4908826 | 0.7853981 | 2.7928972 |
| | 1.6594952 | 0.0928308 | 0.6539441 | 2.1003000 | 2.1925342 1.3610254 1.2818340 | | | | | |
| 165 | 0.8697195 | 0.8697191 | 1.0099001 | 0.8270040 | 0.2698354-0.0750028-0.0501752 | 0.3454342 | 0.1464811 | 0.4908826 | 0.7853981 | 2.7788000 |
| | 1.6579494 | 0.0931931 | 0.6535467 | 2.1003334 | 2.1929217 1.3601913 1.2806955 | | | | | |
| 166 | 0.8689209 | 0.8689204 | 1.0095634 | 0.8260665 | 0.2695157-0.0758862-0.0507774 | 0.3451219 | 0.1470259 | 0.4908826 | 0.7853981 | 2.7815609 |
| | 1.6560802 | 0.0935465 | 0.6531506 | 2.1003670 | 2.1933093 1.3593570 1.2795570 | | | | | |
| 167 | 0.8681404 | 0.8681400 | 1.0092267 | 0.8251316 | 0.2691960-0.0767533-0.0513795 | 0.3457793 | 0.1475050 | 0.4908826 | 0.7853981 | 2.7671471 |
| | 1.6549950 | 0.0939195 | 0.6527524 | 2.1004004 | 2.1936968 1.3585226 1.2784179 | | | | | |
| 168 | 0.8673339 | 0.8673335 | 1.0088911 | 0.8241961 | 0.2688763-0.0776145-0.0519733 | 0.3464253 | 0.1479840 | 0.4908826 | 0.7853981 | 2.7702103 |
| | 1.6531124 | 0.0942778 | 0.6523564 | 2.1004337 | 2.1940844 1.3576882 1.2772819 | | | | | |
| 169 | 0.8665270 | 0.8665265 | 1.0085545 | 0.8232601 | 0.2685565-0.0784671-0.0525744 | 0.3470157 | 0.1484715 | 0.4908826 | 0.7853981 | 2.7651186 |
| | 1.6516227 | 0.0946357 | 0.6519587 | 2.1004671 | 2.1944720 1.3568538 1.2761415 | | | | | |
| 170 | 0.8657341 | 0.8657337 | 1.0082159 | 0.8223243 | 0.2682369-0.0793120-0.0531723 | 0.3476069 | 0.1489478 | 0.4908826 | 0.7853981 | 2.7594824 |
| | 1.6501179 | 0.0949987 | 0.6515616 | 2.1005004 | 2.1948594 1.3560194 1.2749966 | | | | | |
| 171 | 0.8649369 | 0.8649365 | 1.0078764 | 0.8213884 | 0.2679172-0.0801557-0.0537683 | 0.3483027 | 0.1494259 | 0.4908826 | 0.7853981 | 2.7540121 |
| | 1.6486273 | 0.0953613 | 0.6511647 | 2.1005337 | 2.1952468 1.3551851 1.2738496 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 172 | 0.8641446 | 0.8641441 | 1.0075378 | 0.8204529 | 0.2675974 | -0.0813587 | -0.0542059 | 0.3489561 | 0.1499018 | 0.4908826 | 0.7853981 | 2.7484150 |
| | 1.6471453 | 0.0957252 | 0.6507665 | 2.1005840 | 2.1960745 | 1.3543377 | 1.2725449 | | | | | |
| 173 | 0.8633481 | 0.8633476 | 1.0071993 | 0.8195171 | 0.2672777 | -0.0823141 | -0.0548416 | 0.3495919 | 0.1503805 | 0.4908826 | 0.7853981 | 2.7429867 |
| | 1.6456337 | 0.0960893 | 0.6503680 | 2.1006184 | 2.1964731 | 1.3535013 | 1.2714186 | | | | | |
| 174 | 0.8625570 | 0.8625565 | 1.0068588 | 0.8185819 | 0.2669581 | -0.0832978 | -0.0554962 | 0.3502559 | 0.1508535 | 0.4908826 | 0.7853981 | 2.7373362 |
| | 1.6441746 | 0.0964528 | 0.6499701 | 2.1006527 | 2.1968613 | 1.3526640 | 1.2703009 | | | | | |
| 175 | 0.8617619 | 0.8617615 | 1.0065174 | 0.8176466 | 0.2666383 | -0.0842648 | -0.0561395 | 0.3509031 | 0.1513284 | 0.4908826 | 0.7853981 | 2.7318506 |
| | 1.6426868 | 0.0968162 | 0.6495722 | 2.1006870 | 2.1972561 | 1.3518267 | 1.2691774 | | | | | |
| 176 | 0.8609673 | 0.8609669 | 1.0061760 | 0.8167117 | 0.2663186 | -0.0852317 | -0.0567829 | 0.3515503 | 0.1518028 | 0.4908826 | 0.7853981 | 2.7263823 |
| | 1.6412020 | 0.0971799 | 0.6491739 | 2.1007214 | 2.1976500 | 1.3509893 | 1.2680550 | | | | | |
| 177 | 0.8601707 | 0.8601702 | 1.0058346 | 0.8157759 | 0.2659989 | -0.0861896 | -0.0574201 | 0.3521885 | 0.1522788 | 0.4908826 | 0.7853981 | 2.7210102 |
| | 1.6397104 | 0.0975445 | 0.6487747 | 2.1007557 | 2.1980486 | 1.3501520 | 1.2669287 | | | | | |
| 178 | 0.8593761 | 0.8593757 | 1.0054913 | 0.8148412 | 0.2656792 | -0.0871590 | -0.0580551 | 0.3528382 | 0.1527513 | 0.4908826 | 0.7853981 | 2.7155590 |
| | 1.6382246 | 0.0979081 | 0.6483765 | 2.1007910 | 2.1984425 | 1.3493157 | 1.2658062 | | | | | |
| 179 | 0.8585822 | 0.8585818 | 1.0051479 | 0.8139064 | 0.2653595 | -0.0881312 | -0.0587114 | 0.3534907 | 0.1532233 | 0.4908826 | 0.7853981 | 2.7101049 |
| | 1.6367397 | 0.0982721 | 0.6479777 | 2.1008253 | 2.1988354 | 1.3484755 | 1.2646847 | | | | | |
| 180 | 0.8577896 | 0.8577892 | 1.0048046 | 0.8129718 | 0.2650398 | -0.0891029 | -0.0593581 | 0.3541427 | 0.1536945 | 0.4908826 | 0.7853981 | 2.7046738 |
| | 1.6352558 | 0.0986366 | 0.6475785 | 2.1008606 | 2.1992283 | 1.3476372 | 1.2635641 | | | | | |
| 181 | 0.8569936 | 0.8569933 | 1.0044603 | 0.8120368 | 0.2647201 | -0.0900694 | -0.0600011 | 0.3547894 | 0.1541672 | 0.4908826 | 0.7853981 | 2.6993046 |
| | 1.6337681 | 0.0990011 | 0.6471790 | 2.1008944 | 2.1996241 | 1.3467949 | 1.2624397 | | | | | |
| 182 | 0.8561984 | 0.8561980 | 1.0041151 | 0.8111022 | 0.2644004 | -0.0910300 | -0.0606401 | 0.3554304 | 0.1546382 | 0.4908826 | 0.7853981 | 2.6940031 |
| | 1.6322784 | 0.0993654 | 0.6467798 | 2.1009302 | 2.2000217 | 1.3459597 | 1.2613153 | | | | | |
| 183 | 0.8554051 | 0.8554047 | 1.0037689 | 0.8101680 | 0.2640836 | -0.0920017 | -0.0612863 | 0.3560823 | 0.1551070 | 0.4908826 | 0.7853981 | 2.6886292 |
| | 1.6307955 | 0.0997297 | 0.6463805 | 2.1009655 | 2.2004147 | 1.3451214 | 1.2601948 | | | | | |
| 184 | 0.8546105 | 0.8546101 | 1.0034218 | 0.8092339 | 0.2637609 | -0.0929733 | -0.0619325 | 0.3567342 | 0.1555757 | 0.4908826 | 0.7853981 | 2.6832743 |
| | 1.6293087 | 0.1000938 | 0.6459814 | 2.1009998 | 2.2008085 | 1.3442812 | 1.2590714 | | | | | |
| 185 | 0.8538138 | 0.8538135 | 1.0030746 | 0.8082995 | 0.2634412 | -0.0939337 | -0.0625713 | 0.3573749 | 0.1560459 | 0.4908826 | 0.7853981 | 2.6780300 |
| | 1.6278191 | 0.1004584 | 0.6455815 | 2.1010351 | 2.2012062 | 1.3434420 | 1.2579460 | | | | | |
| 186 | 0.8530213 | 0.8530210 | 1.0027266 | 0.8073658 | 0.2631215 | -0.0949108 | -0.0632210 | 0.3580323 | 0.1565121 | 0.4908826 | 0.7853981 | 2.6726665 |
| | 1.6263361 | 0.1008228 | 0.6451821 | 2.1010704 | 2.2015982 | 1.3426027 | 1.2568264 | | | | | |
| 187 | 0.8522260 | 0.8522257 | 1.0023775 | 0.8064317 | 0.2628018 | -0.0958783 | -0.0638630 | 0.3586781 | 0.1569794 | 0.4908826 | 0.7853981 | 2.6674175 |
| | 1.6248474 | 0.1011873 | 0.6447822 | 2.1011057 | 2.2019939 | 1.3417616 | 1.2557020 | | | | | |
| 188 | 0.8514314 | 0.8514311 | 1.0020285 | 0.8054981 | 0.2624821 | -0.0968477 | -0.0645093 | 0.3593298 | 0.1574462 | 0.4908826 | 0.7853981 | 2.6621380 |
| | 1.6233616 | 0.1015519 | 0.6443823 | 2.1011410 | 2.2023888 | 1.3409214 | 1.2545795 | | | | | |
| 189 | 0.8506355 | 0.8506352 | 1.0016794 | 0.8045643 | 0.2621624 | -0.0978075 | -0.0651472 | 0.3599699 | 0.1579139 | 0.4908826 | 0.7853981 | 2.6569710 |
| | 1.6218719 | 0.1019173 | 0.6439816 | 2.1011763 | 2.2027874 | 1.3400822 | 1.2534562 | | | | | |
| 190 | 0.8498375 | 0.8498372 | 1.0013285 | 0.8036305 | 0.2618427 | -0.0987645 | -0.0657835 | 0.3606072 | 0.1583810 | 0.4908826 | 0.7853981 | 2.6518421 |
| | 1.6203795 | 0.1022820 | 0.6435813 | 2.1012125 | 2.2031870 | 1.3392401 | 1.2523270 | | | | | |
| 191 | 0.8490458 | 0.8490454 | 1.0009766 | 0.8026974 | 0.2615229 | -0.0997166 | -0.0664164 | 0.3612695 | 0.1588480 | 0.4908826 | 0.7853981 | 2.6465311 |
| | 1.6188974 | 0.1026465 | 0.6431814 | 2.1012478 | 2.2035770 | 1.3383989 | 1.2512083 | | | | | |
| 192 | 0.8482506 | 0.8482503 | 1.0006247 | 0.8017638 | 0.2612032 | -0.1006749 | -0.0670532 | 0.3619182 | 0.1593074 | 0.4908826 | 0.7853981 | 2.6413488 |
| | 1.6174107 | 0.1030116 | 0.6427807 | 2.1012831 | 2.2039728 | 1.3375578 | 1.2500849 | | | | | |
| 193 | 0.8474548 | 0.8474545 | 1.0002717 | 0.8008304 | 0.2608836 | -0.1016396 | -0.0677214 | 0.3625632 | 0.1597730 | 0.4908826 | 0.7853981 | 2.6361223 |
| | 1.6159229 | 0.1033775 | 0.6423791 | 2.1013184 | 2.2043705 | 1.3367176 | 1.2489605 | | | | | |
| 194 | 0.8466598 | 0.8466595 | 0.9999208 | 0.7998971 | 0.2605639 | -0.1026045 | -0.0683649 | 0.3632114 | 0.1602362 | 0.4908826 | 0.7853981 | 2.6310682 |
| | 1.6144352 | 0.1037429 | 0.6419780 | 2.1013546 | 2.2047672 | 1.3358765 | 1.2478371 | | | | | |
| 195 | 0.8458628 | 0.8458624 | 0.9995672 | 0.7989636 | 0.2602441 | -0.1035695 | -0.0690042 | 0.3638536 | 0.1607001 | 0.4908826 | 0.7853981 | 2.6259890 |
| | 1.6129536 | 0.1041084 | 0.6415767 | 2.1013899 | 2.2051659 | 1.3350334 | 1.2467168 | | | | | |
| 196 | 0.8450685 | 0.8450681 | 0.9992138 | 0.7980310 | 0.2599244 | -0.1045771 | -0.0696474 | 0.3645015 | 0.1611623 | 0.4908826 | 0.7853981 | 2.6208820 |
| | 1.6114578 | 0.1044739 | 0.6411753 | 2.1014261 | 2.2055616 | 1.3341923 | 1.2455883 | | | | | |
| 197 | 0.8442728 | 0.8442724 | 0.9988595 | 0.7970976 | 0.2595048 | -0.1055844 | -0.0702902 | 0.3651491 | 0.1616246 | 0.4908826 | 0.7853981 | 2.6157942 |
| | 1.6099682 | 0.1048403 | 0.6407731 | 2.1014624 | 2.2059593 | 1.3333512 | 1.2444539 | | | | | |
| 198 | 0.8434753 | 0.8434749 | 0.9985058 | 0.7961645 | 0.2592850 | -0.1065906 | -0.0709258 | 0.3657857 | 0.1620886 | 0.4908826 | 0.7853981 | 2.6108103 |
| | 1.6084766 | 0.1052068 | 0.6403705 | 2.1014977 | 2.2063608 | 1.3325090 | 1.2433367 | | | | | |
| 199 | 0.8426818 | 0.8426815 | 0.9981511 | 0.7952313 | 0.2589653 | -0.1074764 | -0.0715742 | 0.3664417 | 0.1625491 | 0.4908826 | 0.7853981 | 2.6056919 |
| | 1.6069918 | 0.1055735 | 0.6399677 | 2.1015339 | 2.2067566 | 1.3316679 | 1.2422152 | | | | | |
| 200 | 0.8418863 | 0.8418860 | 0.9977964 | 0.7942991 | 0.2586457 | -0.1084437 | -0.0722166 | 0.3670889 | 0.1630087 | 0.4908826 | 0.7853981 | 2.6006584 |
| | 1.6055040 | 0.1059393 | 0.6395659 | 2.1015701 | 2.2071533 | 1.3308249 | 1.2410917 | | | | | |
| 201 | 0.8410897 | 0.8410893 | 0.9974471 | 0.7933662 | 0.2583259 | -0.1094075 | -0.0728574 | 0.3677335 | 0.1634687 | 0.4908826 | 0.7853981 | 2.5956621 |
| | 1.6040134 | 0.1063054 | 0.6391636 | 2.1016064 | 2.2075520 | 1.3299804 | 1.2399654 | | | | | |
| 202 | 0.8402924 | 0.8402920 | 0.9970831 | 0.7924332 | 0.2580062 | -0.1103666 | -0.0734943 | 0.3683723 | 0.1639293 | 0.4908826 | 0.7853981 | 2.5907288 |
| | 1.6025219 | 0.1066721 | 0.6387605 | 2.1016426 | 2.2079535 | 1.3291388 | 1.2388371 | | | | | |
| 203 | 0.8394971 | 0.8394968 | 0.9967219 | 0.7915014 | 0.2576865 | -0.1113330 | -0.0741367 | 0.3690195 | 0.1643873 | 0.4908826 | 0.7853981 | 2.5857458 |
| | 1.6010342 | 0.1070388 | 0.6383576 | 2.1016788 | 2.2083511 | 1.3282957 | 1.2377148 | | | | | |
| 204 | 0.8387039 | 0.8387036 | 0.9963633 | 0.7905688 | 0.2573668 | -0.1123000 | -0.0747862 | 0.3696776 | 0.1648436 | 0.4908826 | 0.7853981 | 2.5806952 |
| | 1.5995502 | 0.1074052 | 0.6379548 | 2.1017151 | 2.2087450 | 1.3274517 | 1.2365902 | | | | | |
| 205 | 0.8379056 | 0.8379053 | 0.9960029 | 0.7896369 | 0.2570471 | -0.1132692 | -0.0754229 | 0.3703162 | 0.1653015 | 0.4908826 | 0.7853981 | 2.5758114 |
| | 1.5980568 | 0.1077716 | 0.6375518 | 2.1017523 | 2.2091465 | 1.3266077 | 1.2354663 | | | | | |
| 206 | 0.8371100 | 0.8371096 | 0.9956427 | 0.7887049 | 0.2567274 | -0.1142395 | -0.0760649 | 0.3709629 | 0.1657578 | 0.4908826 | 0.7853981 | 2.5708828 |
| | 1.5965672 | 0.1081381 | 0.6371489 | 2.1017885 | 2.2095491 | 1.3257637 | 1.2343415 | | | | | |
| 207 | 0.8363132 | 0.8363128 | 0.9952819 | 0.7877727 | 0.2564077 | -0.1152046 | -0.0767085 | 0.3716123 | 0.1662143 | 0.4908826 | 0.7853981 | 2.5659494 |
| | 1.5950785 | 0.1085051 | 0.6367457 | 2.1018248 | 2.2099526 | 1.3249187 | 1.2332168 | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 208 | 0.8355176 | 0.8355173 | 0.9949206 | 0.7868409 | 0.2560880-0.1161709-0.0773503 | 0.3722588 | 0.1666694 | 0.4908826 | 0.7853981 | 2.5610542 |
| | 1.5935898 | 0.1088721 | 0.6363416 | 2.1018620 | 2.2103415 1.3240747 1.2320919 | | | | | |
| 209 | 0.8347223 | 0.8347219 | 0.9945574 | 0.7859090 | 0.2557682-0.1171399-0.0779439 | 0.3729081 | 0.1671227 | 0.4908826 | 0.7853981 | 2.5561543 |
| | 1.5921011 | 0.1092386 | 0.6359384 | 2.1018982 | 2.2107391 1.3232288 1.2329675 | | | | | |
| 210 | 0.8339257 | 0.8339254 | 0.9941949 | 0.7849773 | 0.2554485-0.1161030-0.0786334 | 0.3735515 | 0.1675773 | 0.4908826 | 0.7853981 | 2.5513153 |
| | 1.5906105 | 0.1096059 | 0.6355343 | 2.1019354 | 2.2111387 1.3223839 1.2294422 | | | | | |
| 211 | 0.8331299 | 0.8331295 | 0.9938316 | 0.7840458 | 0.2551288-0.1150745-0.0792705 | 0.3742033 | 0.1680305 | 0.4908826 | 0.7853981 | 2.5464287 |
| | 1.5891218 | 0.1099730 | 0.6351303 | 2.1019726 | 2.2115364 1.3215380 1.2287178 | | | | | |
| 212 | 0.8323336 | 0.8323332 | 0.9934680 | 0.7831141 | 0.2548091-0.1140432-0.0799214 | 0.3748522 | 0.1684840 | 0.4908826 | 0.7853981 | 2.5415802 |
| | 1.5876331 | 0.1103406 | 0.6347256 | 2.1020088 | 2.2119350 1.3206930 1.2279925 | | | | | |
| 213 | 0.8315372 | 0.8315369 | 0.9931013 | 0.7821825 | 0.2544894-0.1130060-0.0805612 | 0.3754954 | 0.1689363 | 0.4908826 | 0.7853981 | 2.5367899 |
| | 1.5861425 | 0.1107079 | 0.6343213 | 2.1020460 | 2.2123356 1.3193471 1.2264571 | | | | | |
| 214 | 0.8307372 | 0.8307369 | 0.9927344 | 0.7812508 | 0.2541697-0.1119596-0.0811941 | 0.3761293 | 0.1693908 | 0.4908826 | 0.7853981 | 2.5320845 |
| | 1.5846462 | 0.1110754 | 0.6339161 | 2.1020832 | 2.2127399 1.3180012 1.2253370 | | | | | |
| 215 | 0.8299432 | 0.8299428 | 0.9923724 | 0.7803190 | 0.2538500-0.1109310-0.0818391 | 0.3767810 | 0.1698402 | 0.4908826 | 0.7853981 | 2.5272627 |
| | 1.5831604 | 0.1114433 | 0.6335116 | 2.1021204 | 2.2131376 1.3166553 1.2242146 | | | | | |
| 216 | 0.8291466 | 0.8291463 | 0.9920061 | 0.7793884 | 0.2535303-0.1099018-0.0824935 | 0.3774321 | 0.1702910 | 0.4908826 | 0.7853981 | 2.5224600 |
| | 1.5816708 | 0.1118114 | 0.6331063 | 2.1021576 | 2.2135363 1.3153084 1.2230892 | | | | | |
| 217 | 0.8283483 | 0.8283480 | 0.9916384 | 0.7784572 | 0.2532105-0.1088614-0.0831205 | 0.3780719 | 0.1707417 | 0.4908826 | 0.7853981 | 2.5177574 |
| | 1.5801764 | 0.1121789 | 0.6327015 | 2.1021948 | 2.2139387 1.3140606 1.2219610 | | | | | |
| 218 | 0.8275513 | 0.8275509 | 0.9912704 | 0.7775263 | 0.2528908-0.1078265-0.0837611 | 0.3787173 | 0.1711912 | 0.4908826 | 0.7853981 | 2.5130281 |
| | 1.5786858 | 0.1125467 | 0.6322963 | 2.1022320 | 2.2143394 1.3128137 1.2208347 | | | | | |
| 219 | 0.8267552 | 0.8267548 | 0.9909021 | 0.7765955 | 0.2525712-0.1067941-0.0844033 | 0.3793653 | 0.1716396 | 0.4908826 | 0.7853981 | 2.5082960 |
| | 1.5771961 | 0.1129149 | 0.6318907 | 2.1022701 | 2.2147388 1.3115669 1.2197104 | | | | | |
| 220 | 0.8259565 | 0.8259562 | 0.9905326 | 0.7756646 | 0.2522514-0.1057530-0.0850397 | 0.3800045 | 0.1720887 | 0.4908826 | 0.7853981 | 2.5036421 |
| | 1.5757017 | 0.1132829 | 0.6314849 | 2.1023073 | 2.2151423 1.3103191 1.2185412 | | | | | |
| 221 | 0.8251607 | 0.8251604 | 0.9901632 | 0.7747337 | 0.2519317-0.1047230-0.0856833 | 0.3806548 | 0.1725360 | 0.4908826 | 0.7853981 | 2.4989233 |
| | 1.5742130 | 0.1136512 | 0.6310791 | 2.1023455 | 2.2155459 1.3090713 1.2174568 | | | | | |
| 222 | 0.8243650 | 0.8243646 | 0.9897925 | 0.7738031 | 0.2516120-0.1036934-0.0863273 | 0.3813055 | 0.1729819 | 0.4908826 | 0.7853981 | 2.4942169 |
| | 1.5727243 | 0.1140199 | 0.6306728 | 2.1023827 | 2.2159495 1.3078234 1.2163324 | | | | | |
| 223 | 0.8235655 | 0.8235652 | 0.9894216 | 0.7728720 | 0.2512923-0.1026665-0.0869597 | 0.3819388 | 0.1734302 | 0.4908826 | 0.7853981 | 2.4896517 |
| | 1.5712280 | 0.1143885 | 0.6302663 | 2.1024208 | 2.2163558 1.3065747 1.2152023 | | | | | |
| 224 | 0.8227684 | 0.8227684 | 0.9890506 | 0.7719416 | 0.2509726-0.1016490-0.0875798 | 0.3825915 | 0.1738763 | 0.4908826 | 0.7853981 | 2.4849606 |
| | 1.5697384 | 0.1147575 | 0.6298595 | 2.1024580 | 2.2167654 1.3052268 1.2140770 | | | | | |
| 225 | 0.8219715 | 0.8219712 | 0.9886780 | 0.7710111 | 0.2506528-0.1006406-0.0882429 | 0.3832335 | 0.1743215 | 0.4908826 | 0.7853981 | 2.4803619 |
| | 1.5682459 | 0.1151261 | 0.6294531 | 2.1024961 | 2.2171778 1.3039781 1.2129488 | | | | | |
| 226 | 0.8211746 | 0.8211742 | 0.9883034 | 0.7700812 | 0.2503332-0.1335526-0.0888876 | 0.3838858 | 0.1747643 | 0.4908826 | 0.7853981 | 2.4757032 |
| | 1.5667562 | 0.1154938 | 0.6290474 | 2.1025343 | 2.2175965 1.3026274 1.2118244 | | | | | |
| 227 | 0.8203770 | 0.8203766 | 0.9879293 | 0.7691510 | 0.2500135-0.1345165-0.0895271 | 0.3845300 | 0.1752080 | 0.4908826 | 0.7853981 | 2.4711180 |
| | 1.5652637 | 0.1158627 | 0.6286404 | 2.1025724 | 2.2179980 1.3079777 1.2106972 | | | | | |
| 228 | 0.8195771 | 0.8195767 | 0.9875546 | 0.7682208 | 0.2496938-0.1354715-0.0901638 | 0.3851653 | 0.1756526 | 0.4908826 | 0.7853981 | 2.4666109 |
| | 1.5637674 | 0.1162314 | 0.6282335 | 2.1026106 | 2.2183933 1.3071280 1.2095671 | | | | | |
| 229 | 0.8187819 | 0.8187816 | 0.9871791 | 0.7672906 | 0.2493740-0.1364493-0.0908089 | 0.3858233 | 0.1760935 | 0.4908826 | 0.7853981 | 2.4619570 |
| | 1.5622797 | 0.1166004 | 0.6278264 | 2.1026487 | 2.2187910 1.3062773 1.2084435 | | | | | |
| 230 | 0.8179811 | 0.8179807 | 0.9868038 | 0.7663604 | 0.2490543-0.1374386-0.0914385 | 0.3864529 | 0.1765383 | 0.4908826 | 0.7853981 | 2.4575176 |
| | 1.5607815 | 0.1169700 | 0.6274184 | 2.1026869 | 2.2191891 1.3054276 1.2073116 | | | | | |
| 231 | 0.8171855 | 0.8171852 | 0.9864277 | 0.7654303 | 0.2487346-0.1383731-0.0920866 | 0.3871077 | 0.1769788 | 0.4908826 | 0.7853981 | 2.4529161 |
| | 1.5592928 | 0.1173394 | 0.6270108 | 2.1027250 | 2.2195878 1.3045769 1.2061872 | | | | | |
| 232 | 0.8163883 | 0.8163880 | 0.9860499 | 0.7645009 | 0.2484149-0.1393869-0.0927252 | 0.3877538 | 0.1774185 | 0.4908826 | 0.7853981 | 2.4483900 |
| | 1.5578022 | 0.1177084 | 0.6266034 | 2.1027632 | 2.2199893 1.3037262 1.2050613 | | | | | |
| 233 | 0.8155887 | 0.8155883 | 0.9856712 | 0.7635712 | 0.2480952-0.1403991-0.0933618 | 0.3883943 | 0.1778589 | 0.4908826 | 0.7853981 | 2.4439173 |
| | 1.5563049 | 0.1180774 | 0.6261958 | 2.1028023 | 2.2203936 1.3028736 1.2039139 | | | | | |
| 234 | 0.8147899 | 0.8147895 | 0.9852920 | 0.7626415 | 0.2477755-0.1412591-0.0939983 | 0.3890346 | 0.1782994 | 0.4908826 | 0.7853981 | 2.4394588 |
| | 1.5548115 | 0.1184469 | 0.6257877 | 2.1028406 | 2.2207980 1.3020229 1.2027627 | | | | | |
| 235 | 0.8139919 | 0.8139915 | 0.9849145 | 0.7617120 | 0.2474558-0.1422245-0.0946362 | 0.3896803 | 0.1787382 | 0.4908826 | 0.7853981 | 2.4349785 |
| | 1.5533190 | 0.1188164 | 0.6253791 | 2.1028795 | 2.2212024 1.3011713 1.2016259 | | | | | |
| 236 | 0.8131929 | 0.8131925 | 0.9845327 | 0.7607822 | 0.2471361-0.1431870-0.0952768 | 0.3903230 | 0.1791763 | 0.4908826 | 0.7853981 | 2.4305305 |
| | 1.5518236 | 0.1191861 | 0.6249711 | 2.1029186 | 2.2216134 1.3003174 1.2004953 | | | | | |
| 237 | 0.8123941 | 0.8123934 | 0.9841530 | 0.7598526 | 0.2468153-0.1441494-0.0959141 | 0.3909656 | 0.1796154 | 0.4908826 | 0.7853981 | 2.4261998 |
| | 1.5503292 | 0.1195564 | 0.6245624 | 2.1029568 | 2.2219282 1.2994621 1.1993711 | | | | | |
| 238 | 0.8115956 | 0.8115953 | 0.9837722 | 0.7589229 | 0.2464967-0.1451085-0.0965478 | 0.3916052 | 0.1800531 | 0.4908826 | 0.7853981 | 2.4217024 |
| | 1.5488368 | 0.1199267 | 0.6241526 | 2.1029950 | 2.2223435 1.2986045 1.1982449 | | | | | |
| 239 | 0.8107928 | 0.8107925 | 0.9833896 | 0.7579932 | 0.2461770-0.1460677-0.0971779 | 0.3922437 | 0.1804896 | 0.4908826 | 0.7853981 | 2.4173358 |
| | 1.5473489 | 0.1202966 | 0.6237419 | 2.1030332 | 2.2227592 1.2977410 1.1971118 | | | | | |
| 240 | 0.8099916 | 0.8099915 | 0.9830065 | 0.7570643 | 0.2458572-0.1470264-0.0977999 | 0.3928819 | 0.1809256 | 0.4908826 | 0.7853981 | 2.4133739 |
| | 1.5458664 | 0.1206664 | 0.6233313 | 2.1030715 | 2.2231791 1.2968716 1.1960047 | | | | | |
| 241 | 0.8089913 | 0.8089910 | 0.9826232 | 0.7561352 | 0.2455375-0.1479824-0.0984157 | 0.3935223 | 0.1813606 | 0.4908826 | 0.7853981 | 2.4151468 |
| | 1.5439634 | 0.1210370 | 0.6229146 | 2.1031097 | 2.2235996 1.2959948 1.1948906 | | | | | |
| 242 | 0.8083856 | 0.8083851 | 0.9822432 | 0.7552060 | 0.2452178-0.1489309-0.0990282 | 0.3941667 | 0.1817967 | 0.4908826 | 0.7853981 | 2.4046202 |
| | 1.5429295 | 0.1214083 | 0.6225140 | 2.1031532 | 2.2240248 1.2951224 1.1937532 | | | | | |
| 243 | 0.8073882 | 0.8073879 | 0.9818576 | 0.7542768 | 0.2448981-0.1498795-0.0996391 | 0.3948236 | 0.1822342 | 0.4908826 | 0.7853981 | 2.4065552 |
| | 1.5409632 | 0.1217690 | 0.6221013 | 2.1031914 | 2.2244628 1.2942478 1.1926147 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 244 | 0.8065810 | 0.8065807 | 0.9814742 | 0.7534475 | 0.2445784 | -0.1498530 | -0.0996935 | 0.3944314 | 0.1828152 | 0.4908826 | 0.7853981 | 2.4024934 |
| | 1.5394535 | 0.1221404 | 0.6216931 | 2.1032419 | 2.2251606 | 1.2934942 | 1.1912031 | | | | | |
| 245 | 0.8057826 | 0.8057823 | 0.9810895 | 0.7524186 | 0.2442587 | -0.1508142 | -0.1003304 | 0.3950729 | 0.1832490 | 0.4908826 | 0.7853981 | 2.3980961 |
| | 1.5379601 | 0.1225119 | 0.6212822 | 2.1032810 | 2.2255669 | 1.2926416 | 1.1900749 | | | | | |
| 246 | 0.8049819 | 0.8049816 | 0.9807031 | 0.7514896 | 0.2439390 | -0.1517727 | -0.1009053 | 0.3957117 | 0.1836826 | 0.4908826 | 0.7853981 | 2.3937902 |
| | 1.5366618 | 0.1228830 | 0.6208714 | 2.1033211 | 2.2259741 | 1.2917862 | 1.1889439 | | | | | |
| 247 | 0.8041809 | 0.8041806 | 0.9803150 | 0.7505610 | 0.2436193 | -0.1527240 | -0.1015960 | 0.3963472 | 0.1841149 | 0.4908826 | 0.7853981 | 2.3895197 |
| | 1.5349636 | 0.1232535 | 0.6204612 | 2.1033602 | 2.2263813 | 1.2909307 | 1.1878119 | | | | | |
| 248 | 0.8033770 | 0.8033767 | 0.9799278 | 0.7496321 | 0.2432995 | -0.1536716 | -0.1022930 | 0.3969713 | 0.1845499 | 0.4908826 | 0.7853981 | 2.3853378 |
| | 1.5334597 | 0.1236249 | 0.6200500 | 2.1034002 | 2.2267933 | 1.2900753 | 1.1866760 | | | | | |
| 249 | 0.8025771 | 0.8025768 | 0.9795402 | 0.7487031 | 0.2429798 | -0.1546355 | -0.1028613 | 0.3976153 | 0.1849819 | 0.4908826 | 0.7853981 | 2.3810358 |
| | 1.5319633 | 0.1239966 | 0.6196384 | 2.1034403 | 2.2272046 | 1.2892199 | 1.1855459 | | | | | |
| 250 | 0.8017744 | 0.8017742 | 0.9791521 | 0.7477744 | 0.2426601 | -0.1555789 | -0.1034459 | 0.3982590 | 0.1854153 | 0.4908826 | 0.7853981 | 2.3768835 |
| | 1.5304623 | 0.1243685 | 0.6192265 | 2.1034803 | 2.2276115 | 1.2883654 | 1.1844120 | | | | | |
| 251 | 0.8009757 | 0.8009753 | 0.9787632 | 0.7468457 | 0.2423404 | -0.1565451 | -0.1041258 | 0.3988855 | 0.1858452 | 0.4908826 | 0.7853981 | 2.3725901 |
| | 1.5289669 | 0.1247405 | 0.6188145 | 2.1035204 | 2.2280169 | 1.2875090 | 1.1832629 | | | | | |
| 252 | 0.8001698 | 0.8001694 | 0.9783736 | 0.7459169 | 0.2420207 | -0.1574768 | -0.1047925 | 0.3994975 | 0.1862792 | 0.4908826 | 0.7853981 | 2.3685389 |
| | 1.5274591 | 0.1251129 | 0.6184020 | 2.1035604 | 2.2284346 | 1.2866535 | 1.1821342 | | | | | |
| 253 | 0.7993685 | 0.7993681 | 0.9779842 | 0.7449881 | 0.2417010 | -0.1584342 | -0.1053764 | 0.4001352 | 0.1867104 | 0.4908826 | 0.7853981 | 2.3643303 |
| | 1.5259600 | 0.1254858 | 0.6179889 | 2.1036005 | 2.2288437 | 1.2857981 | 1.1810122 | | | | | |
| 254 | 0.7985658 | 0.7985654 | 0.9775930 | 0.7440594 | 0.2413813 | -0.1593887 | -0.1060083 | 0.4007699 | 0.1871407 | 0.4908826 | 0.7853981 | 2.3601532 |
| | 1.5244598 | 0.1258578 | 0.6175765 | 2.1036406 | 2.2292538 | 1.2849407 | 1.1798782 | | | | | |
| 255 | 0.7977626 | 0.7977622 | 0.9772018 | 0.7431309 | 0.2410616 | -0.1603312 | -0.1066321 | 0.4013928 | 0.1875713 | 0.4908826 | 0.7853981 | 2.3560677 |
| | 1.5229559 | 0.1262306 | 0.6171634 | 2.1036816 | 2.2296677 | 1.2840843 | 1.1787434 | | | | | |
| 256 | 0.7969616 | 0.7969612 | 0.9768096 | 0.7422035 | 0.2407418 | -0.1612480 | -0.1072656 | 0.4020049 | 0.1879995 | 0.4908826 | 0.7853981 | 2.3519001 |
| | 1.5214577 | 0.1266035 | 0.6167501 | 2.1037216 | 2.2300768 | 1.2832279 | 1.1776114 | | | | | |
| 257 | 0.7961614 | 0.7961611 | 0.9764176 | 0.7412736 | 0.2404221 | -0.1622503 | -0.1078922 | 0.4026725 | 0.1884275 | 0.4908826 | 0.7853981 | 2.3477097 |
| | 1.5199594 | 0.1269773 | 0.6163360 | 2.1037626 | 2.2304850 | 1.2823706 | 1.1764803 | | | | | |
| 258 | 0.7953585 | 0.7953582 | 0.9760240 | 0.7403455 | 0.2401025 | -0.1632037 | -0.1085330 | 0.4033061 | 0.1888555 | 0.4908826 | 0.7853981 | 2.3435898 |
| | 1.5184593 | 0.1273498 | 0.6159226 | 2.1038027 | 2.2308960 | 1.2815132 | 1.1753464 | | | | | |
| 259 | 0.7945548 | 0.7945545 | 0.9756304 | 0.7394171 | 0.2397828 | -0.1641487 | -0.1091584 | 0.4039315 | 0.1892841 | 0.4908826 | 0.7853981 | 2.3395348 |
| | 1.5169544 | 0.1277231 | 0.6155086 | 2.1038437 | 2.2313099 | 1.2806549 | 1.1742105 | | | | | |
| 260 | 0.7937537 | 0.7937533 | 0.9752353 | 0.7384887 | 0.2394630 | -0.1651077 | -0.1097928 | 0.4045707 | 0.1897096 | 0.4908826 | 0.7853981 | 2.3354034 |
| | 1.5154562 | 0.1280963 | 0.6150947 | 2.1038847 | 2.2317190 | 1.2797966 | 1.1730705 | | | | | |
| 261 | 0.7929500 | 0.7929497 | 0.9748404 | 0.7375603 | 0.2391433 | -0.1660495 | -0.1104159 | 0.4051929 | 0.1901370 | 0.4908826 | 0.7853981 | 2.3313942 |
| | 1.5139513 | 0.1284703 | 0.6146798 | 2.1039257 | 2.2321368 | 1.2789392 | 1.1719427 | | | | | |
| 262 | 0.7921466 | 0.7921462 | 0.9744446 | 0.7366322 | 0.2388236 | -0.1669995 | -0.1110443 | 0.4058231 | 0.1905633 | 0.4908826 | 0.7853981 | 2.3273439 |
| | 1.5124483 | 0.1288441 | 0.6142650 | 2.1039667 | 2.2325578 | 1.2780800 | 1.1708078 | | | | | |
| 263 | 0.7913452 | 0.7913448 | 0.9740474 | 0.7357045 | 0.2385039 | -0.1679606 | -0.1116799 | 0.4064645 | 0.1909867 | 0.4908826 | 0.7853981 | 2.3232346 |
| | 1.5109501 | 0.1292176 | 0.6138505 | 2.1040077 | 2.2329869 | 1.2772217 | 1.1696758 | | | | | |
| 264 | 0.7905418 | 0.7905415 | 0.9736486 | 0.7347769 | 0.2381842 | -0.1689104 | -0.1123282 | 0.4070947 | 0.1914100 | 0.4908826 | 0.7853981 | 2.3192091 |
| | 1.5094461 | 0.1295903 | 0.6134367 | 2.1040487 | 2.2334089 | 1.2763605 | 1.1685400 | | | | | |
| 265 | 0.7897382 | 0.7897378 | 0.9732500 | 0.7338483 | 0.2378645 | -0.1698574 | -0.1129365 | 0.4077219 | 0.1918337 | 0.4908826 | 0.7853981 | 2.3152142 |
| | 1.5079432 | 0.1299639 | 0.6130218 | 2.1040897 | 2.2338328 | 1.2754973 | 1.1674051 | | | | | |
| 266 | 0.7889336 | 0.7889333 | 0.9728519 | 0.7329207 | 0.2375448 | -0.1708041 | -0.1135005 | 0.4083489 | 0.1922585 | 0.4908826 | 0.7853981 | 2.3112316 |
| | 1.5064383 | 0.1303387 | 0.6126057 | 2.1041307 | 2.2342576 | 1.2746320 | 1.1662688 | | | | | |
| 267 | 0.7881319 | 0.7881315 | 0.9724529 | 0.7319928 | 0.2372251 | -0.1717619 | -0.1141938 | 0.4089869 | 0.1926806 | 0.4908826 | 0.7853981 | 2.3071909 |
| | 1.5049381 | 0.1307136 | 0.6121897 | 2.1041727 | 2.2346827 | 1.2737618 | 1.1651359 | | | | | |
| 268 | 0.7873297 | 0.7873294 | 0.9720523 | 0.7310650 | 0.2369053 | -0.1727219 | -0.1148264 | 0.4096273 | 0.1931010 | 0.4908826 | 0.7853981 | 2.3031483 |
| | 1.5034380 | 0.1310872 | 0.6117744 | 2.1042137 | 2.2351087 | 1.2728906 | 1.1640024 | | | | | |
| 269 | 0.7865227 | 0.7865224 | 0.9716512 | 0.7301371 | 0.2365856 | -0.1736542 | -0.1154648 | 0.4102398 | 0.1935248 | 0.4908826 | 0.7853981 | 2.2992926 |
| | 1.5019274 | 0.1314622 | 0.6113583 | 2.1042557 | 2.2356343 | 1.2720094 | 1.1628618 | | | | | |
| 270 | 0.7857225 | 0.7857221 | 0.9712496 | 0.7292100 | 0.2362660 | -0.1746197 | -0.1160830 | 0.4108657 | 0.1939431 | 0.4908826 | 0.7853981 | 2.2952375 |
| | 1.5004311 | 0.1318363 | 0.6109421 | 2.1042967 | 2.2360865 | 1.2711192 | 1.1617108 | | | | | |
| 271 | 0.7849185 | 0.7849182 | 0.9708466 | 0.7282822 | 0.2359462 | -0.1755739 | -0.1167136 | 0.4115201 | 0.1943627 | 0.4908826 | 0.7853981 | 2.2912664 |
| | 1.4989271 | 0.1322105 | 0.6105261 | 2.1043386 | 2.2364595 | 1.2702362 | 1.1605549 | | | | | |
| 272 | 0.7841131 | 0.7841128 | 0.9704440 | 0.7273544 | 0.2356265 | -0.1765106 | -0.1173360 | 0.4121431 | 0.1947837 | 0.4908826 | 0.7853981 | 2.2873783 |
| | 1.4974203 | 0.1325859 | 0.6101093 | 2.1043806 | 2.2368762 | 1.2693450 | 1.1593872 | | | | | |
| 273 | 0.7833116 | 0.7833112 | 0.9700409 | 0.7264269 | 0.2353068 | -0.1774733 | -0.1179689 | 0.4127601 | 0.1952016 | 0.4908826 | 0.7853981 | 2.2834139 |
| | 1.4959192 | 0.1329613 | 0.6096920 | 2.1044226 | 2.2372882 | 1.2684524 | 1.1582242 | | | | | |
| 274 | 0.7825063 | 0.7825060 | 0.9696360 | 0.7254993 | 0.2349871 | -0.1784184 | -0.1185943 | 0.4133855 | 0.1956202 | 0.4908826 | 0.7853981 | 2.2795343 |
| | 1.4944134 | 0.1333362 | 0.6092747 | 2.1044645 | 2.2377050 | 1.2675537 | 1.1571465 | | | | | |
| 275 | 0.7816997 | 0.7816993 | 0.9692315 | 0.7245717 | 0.2346674 | -0.1793607 | -0.1192158 | 0.4140080 | 0.1960402 | 0.4908826 | 0.7853981 | 2.2756824 |
| | 1.4929047 | 0.1337117 | 0.6088570 | 2.1045065 | 2.2381227 | 1.2666477 | 1.1560469 | | | | | |
| 276 | 0.7808963 | 0.7808959 | 0.9688244 | 0.7236446 | 0.2343476 | -0.1803142 | -0.1198358 | 0.4146618 | 0.1964554 | 0.4908826 | 0.7853981 | 2.2717714 |
| | 1.4914017 | 0.1340866 | 0.6084400 | 2.1045485 | 2.2385416 | 1.2657402 | 1.1549120 | | | | | |
| 277 | 0.7800916 | 0.7800913 | 0.9684144 | 0.7227172 | 0.2340260 | -0.1812614 | -0.1204515 | 0.4152494 | 0.1968724 | 0.4908826 | 0.7853981 | 2.2679100 |
| | 1.4899958 | 0.1344621 | 0.6080223 | 2.1045914 | 2.2389614 | 1.2648308 | 1.1537752 | | | | | |
| 278 | 0.7792867 | 0.7792863 | 0.9680117 | 0.7217896 | 0.2337043 | -0.1822117 | -0.1210492 | 0.4158203 | 0.1972893 | 0.4908826 | 0.7853981 | 2.2640429 |
| | 1.4883929 | 0.1348382 | 0.6076034 | 2.1046333 | 2.2393812 | 1.2639175 | 1.1526375 | | | | | |
| 279 | 0.7784821 | 0.7784817 | 0.9676051 | 0.7208623 | 0.2333825 | -0.1831619 | -0.1216266 | 0.4165504 | 0.1977056 | 0.4908826 | 0.7853981 | 2.2601862 |
| | 1.4868851 | 0.1352145 | 0.6071851 | 2.1046762 | 2.2398010 | 1.2630030 | 1.1515007 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 280 | 0.7776779 | 0.7776775 | 0.9671956 | 0.7199351 | 0.2330688-0.1841145-0.1223558 | 0.4171833 | 0.1981190 | 0.4908826 | 0.7853981 | 2.2563257 |
| | 1.4853811 | 0.1355902 | 0.6067669 | 2.1047182 | 2.2999869 1.2625685 1.1503649 | | | | | |
| 281 | 0.7768725 | 0.7768721 | 0.9667862 | 0.7190083 | 0.2327491-0.1850582-0.1229769 | 0.4178073 | 0.1985332 | 0.4908826 | 0.7853981 | 2.2525301 |
| | 1.4838734 | 0.1359662 | 0.6063483 | 2.1047611 | 2.2404146 1.2617044 1.1492262 | | | | | |
| 282 | 0.7760674 | 0.7760670 | 0.9663751 | 0.7180812 | 0.2324294-0.1860077-0.1236058 | 0.4184371 | 0.1989457 | 0.4908826 | 0.7853981 | 2.2487097 |
| | 1.4823675 | 0.1363419 | 0.6059299 | 2.1048040 | 2.2408304 1.2608385 1.1480394 | | | | | |
| 283 | 0.7752620 | 0.7752616 | 0.9659635 | 0.7171545 | 0.2321037-0.1869625-0.1242362 | 0.4190722 | 0.1993577 | 0.4908826 | 0.7853981 | 2.2448683 |
| | 1.4808626 | 0.1367174 | 0.6055115 | 2.1048469 | 2.2412463 1.2599716 1.1469517 | | | | | |
| 284 | 0.7744583 | 0.7744580 | 0.9655525 | 0.7162272 | 0.2317900-0.1879145-0.1248645 | 0.4197045 | 0.1997694 | 0.4908826 | 0.7853981 | 2.2410555 |
| | 1.4793577 | 0.1370942 | 0.6050918 | 2.1048889 | 2.2416601 1.2591066 1.1458158 | | | | | |
| 285 | 0.7736511 | 0.7736507 | 0.9651409 | 0.7153003 | 0.2314703-0.1888549-0.1254853 | 0.4203252 | 0.2001828 | 0.4908826 | 0.7853981 | 2.2373228 |
| | 1.4778471 | 0.1374708 | 0.6046722 | 2.1049328 | 2.2420797 1.2582397 1.1446753 | | | | | |
| 286 | 0.7728446 | 0.7728443 | 0.9647291 | 0.7143731 | 0.2311506-0.1897978-0.1261075 | 0.4209483 | 0.2005955 | 0.4908826 | 0.7853981 | 2.2335854 |
| | 1.4763384 | 0.1378485 | 0.6042514 | 2.1049757 | 2.2424994 1.2573748 1.1435350 | | | | | |
| 287 | 0.7720404 | 0.7720400 | 0.9643167 | 0.7134459 | 0.2308308-0.1907548-0.1267371 | 0.4215857 | 0.2010061 | 0.4908826 | 0.7853981 | 2.2297745 |
| | 1.4748344 | 0.1382260 | 0.6038308 | 2.1050186 | 2.2429192 1.2565088 1.1423998 | | | | | |
| 288 | 0.7712349 | 0.7712346 | 0.9639029 | 0.7125187 | 0.2305111-0.1917302-0.1273628 | 0.4222113 | 0.2014162 | 0.4908826 | 0.7853981 | 2.2260427 |
| | 1.4733267 | 0.1386034 | 0.6034101 | 2.1050615 | 2.2433329 1.2556419 1.1412511 | | | | | |
| 289 | 0.7704270 | 0.7704266 | 0.9634877 | 0.7115920 | 0.2301914-0.1926398-0.1279827 | 0.4228312 | 0.2018266 | 0.4908826 | 0.7853981 | 2.2223568 |
| | 1.4718151 | 0.1389805 | 0.6029896 | 2.1051054 | 2.2437534 1.2547741 1.1401196 | | | | | |
| 290 | 0.7696228 | 0.7696224 | 0.9630731 | 0.7106652 | 0.2298717-0.1935990-0.1286155 | 0.4234437 | 0.2022349 | 0.4908826 | 0.7853981 | 2.2185640 |
| | 1.4703112 | 0.1393582 | 0.6025686 | 2.1051493 | 2.2441683 1.2539072 1.1389837 | | | | | |
| 291 | 0.7688152 | 0.7688149 | 0.9626562 | 0.7097384 | 0.2295520-0.1945410-0.1292370 | 0.4240931 | 0.2026434 | 0.4908826 | 0.7853981 | 2.2148838 |
| | 1.4688005 | 0.1397355 | 0.6021476 | 2.1051922 | 2.2445879 1.2530384 1.1378431 | | | | | |
| 292 | 0.7680085 | 0.7680081 | 0.9622405 | 0.7088115 | 0.2292323-0.1954830-0.1298583 | 0.4247153 | 0.2030525 | 0.4908826 | 0.7853981 | 2.2112131 |
| | 1.4672899 | 0.1401138 | 0.6017256 | 2.1052361 | 2.2450085 1.2521796 1.1367025 | | | | | |
| 293 | 0.7672037 | 0.7672034 | 0.9618227 | 0.7078847 | 0.2289126-0.1964273-0.1304039 | 0.4253399 | 0.2034602 | 0.4908826 | 0.7853981 | 2.2075405 |
| | 1.4657803 | 0.1404915 | 0.6013041 | 2.1052799 | 2.2454281 1.2513018 1.1355619 | | | | | |
| 294 | 0.7663954 | 0.7663950 | 0.9614051 | 0.7069581 | 0.2285929-0.1973773-0.1311374 | 0.4259701 | 0.2038665 | 0.4908826 | 0.7853981 | 2.2038441 |
| | 1.4642735 | 0.1408699 | 0.6008823 | 2.1053238 | 2.2458467 1.2504339 1.1344242 | | | | | |
| 295 | 0.7655873 | 0.7655870 | 0.9609858 | 0.7060313 | 0.2282732-0.1983215-0.1317300 | 0.4265947 | 0.2042729 | 0.4908826 | 0.7853981 | 2.2001915 |
| | 1.4627609 | 0.1412479 | 0.6004601 | 2.1053677 | 2.2462673 1.2495632 1.1332817 | | | | | |
| 296 | 0.7647797 | 0.7647793 | 0.9605665 | 0.7051051 | 0.2279535-0.1992625-0.1323504 | 0.4272160 | 0.2046790 | 0.4908826 | 0.7853981 | 2.1965666 |
| | 1.4612503 | 0.1416264 | 0.6000375 | 2.1054115 | 2.2466868 1.2486944 1.1321411 | | | | | |
| 297 | 0.7639769 | 0.7639765 | 0.9601456 | 0.7041783 | 0.2276338-0.2002287-0.1329473 | 0.4278625 | 0.2050804 | 0.4908826 | 0.7853981 | 2.1928062 |
| | 1.4597492 | 0.1420046 | 0.5996153 | 2.1054556 | 2.2471008 1.2478237 1.1310072 | | | | | |
| 298 | 0.7631657 | 0.7631654 | 0.9592757 | 0.7032515 | 0.2273141-0.2011955-0.1335963 | 0.4284696 | 0.2054885 | 0.4908826 | 0.7853981 | 2.1892853 |
| | 1.4582310 | 0.1423840 | 0.5991915 | 2.1055002 | 2.2475290 1.2469549 1.1298609 | | | | | |
| 299 | 0.7623600 | 0.7623597 | 0.9588033 | 0.7023250 | 0.2269943-0.2021650-0.1342273 | 0.4291043 | 0.2058903 | 0.4908826 | 0.7853981 | 2.1856127 |
| | 1.4567237 | 0.1427625 | 0.5987684 | 2.1055441 | 2.2479458 1.2460833 1.1287222 | | | | | |
| 300 | 0.7615551 | 0.7615528 | 0.9584814 | 0.7013987 | 0.2266746-0.2030987-0.1348525 | 0.4297333 | 0.2062934 | 0.4908826 | 0.7853981 | 2.1819839 |
| | 1.4552145 | 0.1431417 | 0.5983451 | 2.1055889 | 2.2483554 1.2452129 1.1275326 | | | | | |
| 301 | 0.7607490 | 0.7607446 | 0.9580576 | 0.7004721 | 0.2263549-0.2040317-0.1354738 | 0.4303566 | 0.2066956 | 0.4908826 | 0.7853981 | 2.1783981 |
| | 1.4537029 | 0.1435205 | 0.5979219 | 2.1056328 | 2.2487649 1.2443409 1.1263410 | | | | | |
| 302 | 0.7599367 | 0.7599363 | 0.9580335 | 0.6995460 | 0.2260352-0.2049387-0.1360911 | 0.4309739 | 0.2070974 | 0.4908826 | 0.7853981 | 2.1748571 |
| | 1.4521896 | 0.1438996 | 0.5974981 | 2.1056776 | 2.2492104 1.2434702 1.1252085 | | | | | |
| 303 | 0.7591296 | 0.7591292 | 0.9576085 | 0.6986194 | 0.2257155-0.2058924-0.1367194 | 0.4316079 | 0.2074978 | 0.4908826 | 0.7853981 | 2.1712284 |
| | 1.4506788 | 0.1442789 | 0.5970742 | 2.1057224 | 2.2496296 1.2425966 1.1241579 | | | | | |
| 304 | 0.7583218 | 0.7583214 | 0.9571837 | 0.6976933 | 0.2253958-0.2068373-0.1373417 | 0.4322331 | 0.2078986 | 0.4908826 | 0.7853981 | 2.1676607 |
| | 1.4491692 | 0.1446580 | 0.5966495 | 2.1057673 | 2.2500505 1.2417250 1.1230173 | | | | | |
| 305 | 0.7575134 | 0.7575130 | 0.9562178 | 0.6967663 | 0.2250761-0.2077852-0.1379661 | 0.4328613 | 0.2082991 | 0.4908826 | 0.7853981 | 2.1640454 |
| | 1.4476557 | 0.1450387 | 0.5962246 | 2.1058121 | 2.2504721 1.2408514 1.1218748 | | | | | |
| 306 | 0.7567055 | 0.7567051 | 0.9563320 | 0.6958400 | 0.2247564-0.2087300-0.1385884 | 0.4334864 | 0.2086990 | 0.4908826 | 0.7853981 | 2.1605377 |
| | 1.4461451 | 0.1454193 | 0.5957990 | 2.1058569 | 2.2508943 1.2399767 1.1207333 | | | | | |
| 307 | 0.7558965 | 0.7558962 | 0.9559045 | 0.6949136 | 0.2244366-0.2096743-0.1392100 | 0.4341109 | 0.2090982 | 0.4908826 | 0.7853981 | 2.1570034 |
| | 1.4446325 | 0.1457990 | 0.5953732 | 2.1059017 | 2.2513161 1.2391052 1.1195908 | | | | | |
| 308 | 0.7550868 | 0.7550865 | 0.9554769 | 0.6939870 | 0.2241165-0.2106186-0.1398345 | 0.4347260 | 0.2094970 | 0.4908826 | 0.7853981 | 2.1535387 |
| | 1.4431162 | 0.1461797 | 0.5949484 | 2.1059465 | 2.2517429 1.2382317 1.1184554 | | | | | |
| 309 | 0.7542777 | 0.7542773 | 0.9550479 | 0.6930612 | 0.2237973-0.2115545-0.1404483 | 0.4353518 | 0.2098954 | 0.4908826 | 0.7853981 | 2.1500072 |
| | 1.4416037 | 0.1465600 | 0.5945228 | 2.1059913 | 2.2521648 1.2373541 1.1173338 | | | | | |
| 310 | 0.7534685 | 0.7534682 | 0.9546193 | 0.6921347 | 0.2234775-0.2124935-0.1410579 | 0.4359730 | 0.2102937 | 0.4908826 | 0.7853981 | 2.1465187 |
| | 1.4400892 | 0.1469413 | 0.5940961 | 2.1060361 | 2.2525862 1.2364765 1.1162039 | | | | | |
| 311 | 0.7526603 | 0.7526620 | 0.9541893 | 0.6912080 | 0.2231578-0.2134354-0.1416649 | 0.4365857 | 0.2106876 | 0.4908826 | 0.7853981 | 2.1429319 |
| | 1.4385824 | 0.1473227 | 0.5936697 | 2.1060810 | 2.2530079 1.2355988 1.1150727 | | | | | |
| 312 | 0.7518504 | 0.7518504 | 0.9537582 | 0.6902825 | 0.2228381-0.2143803-0.1422733 | 0.4372234 | 0.2110857 | 0.4908826 | 0.7853981 | 2.1395273 |
| | 1.4370732 | 0.1477028 | 0.5932434 | 2.1061257 | 2.2534301 1.2347215 1.1139749 | | | | | |
| 313 | 0.7510425 | 0.7510422 | 0.9533203 | 0.6893558 | 0.2225184-0.2153242-0.1428835 | 0.4378526 | 0.2114833 | 0.4908826 | 0.7853981 | 2.1360216 |
| | 1.4355607 | 0.1480840 | 0.5928171 | 2.1061705 | 2.2538526 1.2338441 1.1128771 | | | | | |
| 314 | 0.7502311 | 0.7502308 | 0.9528908 | 0.6884290 | 0.2221987-0.2162671-0.1434955 | 0.4384847 | 0.2118806 | 0.4908826 | 0.7853981 | 2.1326199 |
| | 1.4340524 | 0.1484653 | 0.5923908 | 2.1062152 | 2.2542750 1.2329666 1.1117793 | | | | | |
| 315 | 0.7494242 | 0.7494238 | 0.9519247 | 0.6875033 | 0.2218790-0.2172113-0.1441084 | 0.4391083 | 0.2122774 | 0.4908826 | 0.7853981 | 2.1291218 |
| | 1.4325218 | 0.1488467 | 0.5919647 | 2.1062600 | 2.2546973 1.2320892 1.1106853 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 316 | 0.7486127 | 0.7486123 | 0.9520282 | 0.6865776 | 0.2215593 | -0.2181541 | -0.1447936 | 0.4397134 | 0.2126615 | | | |
| | 1.4310045 | 0.1492288 | 0.5915340 | 2.1063128 | 2.2551346 | 1.2312307 | 1.1092797 | | | | | |
| 317 | 0.7478040 | 0.7478036 | 0.9515939 | 0.6856513 | 0.2212396 | -0.2191079 | -0.1454179 | 0.4403474 | 0.2130569 | 0.4908826 | 0.7853981 | 2.1222172 |
| | 1.4294920 | 0.1496106 | 0.5911061 | 2.1063585 | 2.2555761 | 1.2303534 | 1.1081572 | | | | | |
| 318 | 0.7469941 | 0.7469938 | 0.9511585 | 0.6847255 | 0.2209198 | -0.2200471 | -0.1460356 | 0.4409670 | 0.2134489 | 0.4908826 | 0.7853981 | 2.1188126 |
| | 1.4279757 | 0.1499925 | 0.5906780 | 2.1064053 | 2.2559824 | 1.2294760 | 1.1070127 | | | | | |
| 319 | 0.7461839 | 0.7461835 | 0.9507224 | 0.6837990 | 0.2206001 | -0.2209920 | -0.1466369 | 0.4415921 | 0.2138407 | 0.4908826 | 0.7853981 | 2.1153851 |
| | 1.4264612 | 0.1503749 | 0.5902492 | 2.1064510 | 2.2563988 | 1.2285986 | 1.1058683 | | | | | |
| 320 | 0.7453736 | 0.7453732 | 0.9502863 | 0.6828728 | 0.2202804 | -0.2219337 | -0.1472760 | 0.4422141 | 0.2142321 | 0.4908826 | 0.7853981 | 2.1119843 |
| | 1.4249449 | 0.1507572 | 0.5898234 | 2.1064978 | 2.2568331 | 1.2277203 | 1.1047239 | | | | | |
| 321 | 0.7445619 | 0.7445615 | 0.9498492 | 0.6819467 | 0.2199607 | -0.2228725 | -0.1478932 | 0.4428332 | 0.2146241 | 0.4908826 | 0.7853981 | 2.1086082 |
| | 1.4234266 | 0.1511399 | 0.5893912 | 2.1065445 | 2.2572803 | 1.2268419 | 1.1035767 | | | | | |
| 322 | 0.7437505 | 0.7437502 | 0.9494119 | 0.6810207 | 0.2196419 | -0.2238052 | -0.1485063 | 0.4434463 | 0.2150154 | 0.4908826 | 0.7853981 | 2.1052742 |
| | 1.4219084 | 0.1515227 | 0.5889617 | 2.1065912 | 2.2576895 | 1.2259636 | 1.1024303 | | | | | |
| 323 | 0.7429397 | 0.7429394 | 0.9489741 | 0.6800945 | 0.2193213 | -0.2247464 | -0.1491249 | 0.4440677 | 0.2154058 | 0.4908826 | 0.7853981 | 2.1019020 |
| | 1.4203911 | 0.1519061 | 0.5885316 | 2.1066383 | 2.2581167 | 1.2250853 | 1.1012853 | | | | | |
| 324 | 0.7421296 | 0.7421292 | 0.9485346 | 0.6791683 | 0.2190016 | -0.2256929 | -0.1497468 | 0.4446945 | 0.2157941 | 0.4908826 | 0.7853981 | 2.0985107 |
| | 1.4188757 | 0.1522892 | 0.5881017 | 2.1066847 | 2.2585421 | 1.2242060 | 1.1001406 | | | | | |
| 325 | 0.7413184 | 0.7413180 | 0.9480961 | 0.6782420 | 0.2186819 | -0.2266337 | -0.1503651 | 0.4453156 | 0.2161842 | 0.4908826 | 0.7853981 | 2.0951586 |
| | 1.4173584 | 0.1526737 | 0.5876702 | 2.1067314 | 2.2589712 | 1.2233276 | 1.0989943 | | | | | |
| 326 | 0.7405064 | 0.7405060 | 0.9476558 | 0.6773157 | 0.2183622 | -0.2275712 | -0.1509809 | 0.4459333 | 0.2165731 | 0.4908826 | 0.7853981 | 2.0918341 |
| | 1.4158392 | 0.1530574 | 0.5872394 | 2.1067781 | 2.2593994 | 1.2224474 | 1.0978470 | | | | | |
| 327 | 0.7396957 | 0.7396954 | 0.9472151 | 0.6763895 | 0.2180424 | -0.2285143 | -0.1515905 | 0.4465567 | 0.2169607 | 0.4908826 | 0.7853981 | 2.0884876 |
| | 1.4143219 | 0.1534416 | 0.5868081 | 2.1068250 | 2.2598276 | 1.2215681 | 1.0967015 | | | | | |
| 328 | 0.7388822 | 0.7388818 | 0.9467747 | 0.6754635 | 0.2177226 | -0.2294430 | -0.1522105 | 0.4471658 | 0.2173504 | 0.4908826 | 0.7853981 | 2.0852261 |
| | 1.4127998 | 0.1538261 | 0.5863762 | 2.1068735 | 2.2602596 | 1.2206889 | 1.0955524 | | | | | |
| 329 | 0.7380713 | 0.7380709 | 0.9463332 | 0.6745370 | 0.2174031 | -0.2303912 | -0.1528333 | 0.4477943 | 0.2177374 | 0.4908826 | 0.7853981 | 2.0818691 |
| | 1.4112835 | 0.1542109 | 0.5859439 | 2.1069202 | 2.2606869 | 1.2198076 | 1.0944071 | | | | | |
| 330 | 0.7372620 | 0.7372616 | 0.9458896 | 0.6736112 | 0.2170833 | -0.2313416 | -0.1534573 | 0.4484249 | 0.2181212 | 0.4908826 | 0.7853981 | 2.0785084 |
| | 1.4097700 | 0.1545953 | 0.5855122 | 2.1069679 | 2.2611113 | 1.2189264 | 1.0932636 | | | | | |
| 331 | 0.7364480 | 0.7364477 | 0.9454463 | 0.6726848 | 0.2167636 | -0.2322726 | -0.1540886 | 0.4490362 | 0.2185085 | 0.4908826 | 0.7853981 | 2.0752611 |
| | 1.4082479 | 0.1549802 | 0.5850796 | 2.1070156 | 2.2615442 | 1.2180452 | 1.0921135 | | | | | |
| 332 | 0.7356364 | 0.7356361 | 0.9450012 | 0.6717585 | 0.2164439 | -0.2332200 | -0.1546906 | 0.4496639 | 0.2188926 | 0.4908826 | 0.7853981 | 2.0719337 |
| | 1.4067287 | 0.1553649 | 0.5846472 | 2.1070633 | 2.2619715 | 1.2171621 | 1.0909672 | | | | | |
| 333 | 0.7348238 | 0.7348234 | 0.9445559 | 0.6708327 | 0.2161242 | -0.2341506 | -0.1553115 | 0.4502748 | 0.2192769 | 0.4908826 | 0.7853981 | 2.0687046 |
| | 1.4052076 | 0.1557497 | 0.5842146 | 2.1071110 | 2.2624035 | 1.2162800 | 1.0898190 | | | | | |
| 334 | 0.7340115 | 0.7340112 | 0.9441003 | 0.6699067 | 0.2158045 | -0.2350948 | -0.1559212 | 0.4508994 | 0.2196599 | 0.4908826 | 0.7853981 | 2.0654116 |
| | 1.4036884 | 0.1561348 | 0.5837815 | 2.1071587 | 2.2628317 | 1.2153969 | 1.0886717 | | | | | |
| 335 | 0.7331976 | 0.7331973 | 0.9436628 | 0.6689805 | 0.2154848 | -0.2360247 | -0.1565314 | 0.4515095 | 0.2200440 | 0.4908826 | 0.7853981 | 2.0622034 |
| | 1.4021654 | 0.1565205 | 0.5833478 | 2.1072073 | 2.2632656 | 1.2145147 | 1.0875215 | | | | | |
| 336 | 0.7323857 | 0.7323853 | 0.9432161 | 0.6680545 | 0.2151651 | -0.2369657 | -0.1571488 | 0.4521307 | 0.2204267 | 0.4908826 | 0.7853981 | 2.0589437 |
| | 1.4006472 | 0.1569067 | 0.5829135 | 2.1072550 | 2.2636957 | 1.2136326 | 1.0863743 | | | | | |
| 337 | 0.7315729 | 0.7315725 | 0.9427694 | 0.6671281 | 0.2148454 | -0.2379093 | -0.1577679 | 0.4527546 | 0.2208090 | 0.4908826 | 0.7853981 | 2.0556793 |
| | 1.3991261 | 0.1572926 | 0.5824793 | 2.1073036 | 2.2641258 | 1.2127476 | 1.0852261 | | | | | |
| 338 | 0.7307597 | 0.7307593 | 0.9423183 | 0.6662021 | 0.2145256 | -0.2388546 | -0.1583847 | 0.4533753 | 0.2211892 | 0.4908826 | 0.7853981 | 2.0524406 |
| | 1.3976049 | 0.1576781 | 0.5820454 | 2.1073523 | 2.2645559 | 1.2118626 | 1.0840778 | | | | | |
| 339 | 0.7299467 | 0.7299464 | 0.9418682 | 0.6652761 | 0.2142059 | -0.2398075 | -0.1590000 | 0.4539934 | 0.2215693 | 0.4908826 | 0.7853981 | 2.0492220 |
| | 1.3960838 | 0.1580639 | 0.5816111 | 2.1074009 | 2.2649870 | 1.2109776 | 1.0829287 | | | | | |
| 340 | 0.7291317 | 0.7291313 | 0.9414182 | 0.6643499 | 0.2138862 | -0.2407617 | -0.1596126 | 0.4546079 | 0.2219509 | 0.4908826 | 0.7853981 | 2.0460310 |
| | 1.3945599 | 0.1584505 | 0.5811759 | 2.1074486 | 2.2654200 | 1.2100925 | 1.0817776 | | | | | |
| 341 | 0.7283193 | 0.7283190 | 0.9409670 | 0.6634240 | 0.2135665 | -0.2417173 | -0.1602287 | 0.4552279 | 0.2223294 | 0.4908826 | 0.7853981 | 2.0428200 |
| | 1.3930387 | 0.1588370 | 0.5807407 | 2.1074982 | 2.2658520 | 1.2092075 | 1.0806303 | | | | | |
| 342 | 0.7273388 | 0.7273384 | 0.9405147 | 0.6624978 | 0.2132468 | -0.2426728 | -0.1608446 | 0.4558496 | 0.2227080 | 0.4908826 | 0.7853981 | 2.0396392 |
| | 1.3912048 | 0.1592238 | 0.5803050 | 2.1075463 | 2.2662820 | 1.2083216 | 1.0792765 | | | | | |
| 343 | 0.7266836 | 0.7266833 | 0.9400633 | 0.6615717 | 0.2129271 | -0.2436314 | -0.1614651 | 0.4564685 | 0.2230928 | 0.4908826 | 0.7853981 | 2.0366240 |
| | 1.3899794 | 0.1596109 | 0.5798685 | 2.1075964 | 2.2667094 | 1.2074366 | 1.0779195 | | | | | |
| 344 | 0.7257103 | 0.7257097 | 0.9396095 | 0.6606458 | 0.2126074 | -0.2445905 | -0.1620901 | 0.4570929 | 0.2234761 | 0.4908826 | 0.7853981 | 2.0372972 |
| | 1.3881569 | 0.1599980 | 0.5794327 | 2.1076546 | 2.2671498 | 1.2065496 | 1.0769434 | | | | | |
| 345 | 0.7250530 | 0.7250526 | 0.9391575 | 0.6597189 | 0.2122877 | -0.2455534 | -0.1627168 | 0.4576530 | 0.2238610 | 0.4908826 | 0.7853981 | 2.0303364 |
| | 1.3869286 | 0.1603864 | 0.5789946 | 2.1076946 | 2.2676010 | 1.2056634 | 1.0757155 | | | | | |
| 346 | 0.7240782 | 0.7240779 | 0.9387044 | 0.6587924 | 0.2119679 | -0.2465213 | -0.1633465 | 0.4582193 | 0.2242361 | 0.4908826 | 0.7853981 | 2.0310221 |
| | 1.3851042 | 0.1607651 | 0.5785567 | 2.1077538 | 2.2680344 | 1.2047777 | 1.0746844 | | | | | |
| 347 | 0.7232592 | 0.7232589 | 0.9382510 | 0.6578659 | 0.2116483 | -0.2474956 | -0.1639775 | 0.4587834 | 0.2246170 | 0.4908826 | 0.7853981 | 2.0279799 |
| | 1.3835776 | 0.1611536 | 0.5781186 | 2.1078033 | 2.2684706 | 1.2038918 | 1.0734415 | | | | | |
| 348 | 0.7224448 | 0.7224445 | 0.9377965 | 0.6569399 | 0.2113286 | -0.2484700 | -0.1646094 | 0.4593292 | 0.2250037 | 0.4908826 | 0.7853981 | 2.0248356 |
| | 1.3820486 | 0.1615427 | 0.5776801 | 2.1078529 | 2.2689127 | 1.2030058 | 1.0721985 | | | | | |
| 349 | 0.7216286 | 0.7216282 | 0.9373404 | 0.6560133 | 0.2110088 | -0.2494331 | -0.1652513 | 0.4598419 | 0.2254704 | 0.4908826 | 0.7853981 | 2.0217142 |
| | 1.3805208 | 0.1619312 | 0.5772418 | 2.1079025 | 2.2693595 | 1.2021170 | 1.0711775 | | | | | |
| 350 | 0.7208126 | 0.7208123 | 0.9368839 | 0.6550871 | 0.2106891 | -0.2503943 | -0.1658939 | 0.4599574 | 0.2256464 | 0.4908826 | 0.7853981 | 2.0185671 |
| | 1.3789959 | 0.1623204 | 0.5768028 | 2.1079521 | 2.2700053 | 1.2012291 | 1.0700254 | | | | | |
| 351 | 0.7199957 | 0.7199953 | 0.9364267 | 0.6541605 | 0.2103694 | -0.2513576 | -0.1665226 | 0.4605671 | 0.2262225 | 0.4908826 | 0.7853981 | 2.0154972 |
| | 1.3774681 | 0.1627094 | 0.5763638 | 2.1080017 | 2.2704330 | 1.2003403 | 1.0688715 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 352 | 0.7191796 | 0.7191793 | 0.9359683 | 0.6532341 | 0.2100497 | -0.2511206 | -0.1664408 | 0.4611763 | 0.2265968 | 0.4908826 | 0.7853981 | 2.0124168 |
| | 1.3759413 | 0.1630990 | 0.5759242 | 2.1080523 | 2.2709217 | 1.1994524 | 1.0677185 | | | | | |
| 353 | 0.7183627 | 0.7183623 | 0.9355096 | 0.6523075 | 0.2097305 | -0.2520584 | -0.1670411 | 0.4617884 | 0.2269714 | 0.4908826 | 0.7853981 | 2.0093298 |
| | 1.3744125 | 0.1634887 | 0.5754843 | 2.1081028 | 2.2713604 | 1.1985626 | 1.0665446 | | | | | |
| 354 | 0.7175469 | 0.7175466 | 0.9350502 | 0.6513812 | 0.2094103 | -0.2529896 | -0.1676536 | 0.4623999 | 0.2273445 | 0.4908826 | 0.7853981 | 2.0062532 |
| | 1.3728857 | 0.1638784 | 0.5750443 | 2.1081524 | 2.2717981 | 1.1976738 | 1.0654116 | | | | | |
| 355 | 0.7167299 | 0.7167295 | 0.9345909 | 0.6504546 | 0.2090906 | -0.2539206 | -0.1682660 | 0.4630111 | 0.2277187 | 0.4908826 | 0.7853981 | 2.0031853 |
| | 1.3713579 | 0.1642688 | 0.5746035 | 2.1082029 | 2.2722368 | 1.1967840 | 1.0642576 | | | | | |
| 356 | 0.7159122 | 0.7159119 | 0.9341301 | 0.6495281 | 0.2087709 | -0.2548513 | -0.1688691 | 0.4636222 | 0.2280917 | 0.4908826 | 0.7853981 | 2.0001268 |
| | 1.3698282 | 0.1646591 | 0.5741625 | 2.1082535 | 2.2726765 | 1.1958933 | 1.0631027 | | | | | |
| 357 | 0.7150961 | 0.7150958 | 0.9336690 | 0.6486018 | 0.2084512 | -0.2557821 | -0.1694702 | 0.4642332 | 0.2284635 | 0.4908826 | 0.7853981 | 1.9970751 |
| | 1.3683014 | 0.1650500 | 0.5737211 | 2.1083040 | 2.2731152 | 1.1950045 | 1.0619497 | | | | | |
| 358 | 0.7142783 | 0.7142780 | 0.9332067 | 0.6476749 | 0.2081314 | -0.2567124 | -0.1700675 | 0.4648439 | 0.2288353 | 0.4908826 | 0.7853981 | 1.9940329 |
| | 1.3667717 | 0.1654402 | 0.5732793 | 2.1083555 | 2.2735558 | 1.1941128 | 1.0607948 | | | | | |
| 359 | 0.7134583 | 0.7134580 | 0.9327450 | 0.6467486 | 0.2078117 | -0.2576289 | -0.1706866 | 0.4654406 | 0.2292091 | 0.4908826 | 0.7853981 | 1.9910660 |
| | 1.3652372 | 0.1658323 | 0.5728369 | 2.1084061 | 2.2740002 | 1.1932220 | 1.0596361 | | | | | |
| 360 | 0.7126409 | 0.7126406 | 0.9322812 | 0.6458218 | 0.2074921 | -0.2585585 | -0.1712956 | 0.4660506 | 0.2295792 | 0.4908826 | 0.7853981 | 1.9880419 |
| | 1.3637075 | 0.1662238 | 0.5723944 | 2.1084576 | 2.2744438 | 1.1923304 | 1.0584812 | | | | | |
| 361 | 0.7118239 | 0.7118236 | 0.9318177 | 0.6448953 | 0.2071723 | -0.2594938 | -0.1719004 | 0.4666661 | 0.2299492 | 0.4908826 | 0.7853981 | 1.9849977 |
| | 1.3621798 | 0.1666153 | 0.5719518 | 2.1085081 | 2.2748804 | 1.1914387 | 1.0573273 | | | | | |
| 362 | 0.7110066 | 0.7110063 | 0.9313534 | 0.6439683 | 0.2068526 | -0.2604260 | -0.1725150 | 0.4672787 | 0.2303189 | 0.4908826 | 0.7853981 | 1.9819756 |
| | 1.3606501 | 0.1670073 | 0.5715079 | 2.1085596 | 2.2753210 | 1.1905470 | 1.0561724 | | | | | |
| 363 | 0.7101856 | 0.7101853 | 0.9308884 | 0.6430415 | 0.2065329 | -0.2613613 | -0.1731144 | 0.4678742 | 0.2306902 | 0.4908826 | 0.7853981 | 1.9790430 |
| | 1.3591137 | 0.1673001 | 0.5710642 | 2.1086111 | 2.2757673 | 1.1896544 | 1.0550127 | | | | | |
| 364 | 0.7093683 | 0.7093680 | 0.9304217 | 0.6421150 | 0.2062132 | -0.2622755 | -0.1737251 | 0.4684887 | 0.2310575 | 0.4908826 | 0.7853981 | 1.9760256 |
| | 1.3575853 | 0.1677923 | 0.5706205 | 2.1086626 | 2.2762079 | 1.1887617 | 1.0538578 | | | | | |
| 365 | 0.7085493 | 0.7085490 | 0.9299554 | 0.6411880 | 0.2058935 | -0.2632016 | -0.1743305 | 0.4690951 | 0.2314263 | 0.4908826 | 0.7853981 | 1.9730558 |
| | 1.3560524 | 0.1681854 | 0.5701754 | 2.1087141 | 2.2766514 | 1.1878691 | 1.0527010 | | | | | |
| 366 | 0.7077317 | 0.7077314 | 0.9294873 | 0.6402612 | 0.2055738 | -0.2641379 | -0.1749424 | 0.4697117 | 0.2317926 | 0.4908826 | 0.7853981 | 1.9700422 |
| | 1.3545237 | 0.1685781 | 0.5697314 | 2.1087656 | 2.2770910 | 1.1869745 | 1.0515461 | | | | | |
| 367 | 0.7069124 | 0.7069121 | 0.9290191 | 0.6393344 | 0.2052541 | -0.2650607 | -0.1755455 | 0.4703148 | 0.2321597 | 0.4908826 | 0.7853981 | 1.9671021 |
| | 1.3529902 | 0.1689712 | 0.5692863 | 2.1088181 | 2.2775364 | 1.1860809 | 1.0503883 | | | | | |
| 368 | 0.7060923 | 0.7060920 | 0.9285501 | 0.6384076 | 0.2049344 | -0.2659885 | -0.1761516 | 0.4709228 | 0.2325267 | 0.4908826 | 0.7853981 | 1.9641447 |
| | 1.3514576 | 0.1693645 | 0.5688410 | 2.1088696 | 2.2779799 | 1.1851864 | 1.0492306 | | | | | |
| 369 | 0.7052726 | 0.7052723 | 0.9280813 | 0.6374809 | 0.2046146 | -0.2669079 | -0.1767523 | 0.4715226 | 0.2328935 | 0.4908826 | 0.7853981 | 1.9612341 |
| | 1.3499222 | 0.1697584 | 0.5683949 | 2.1089220 | 2.2784262 | 1.1842918 | 1.0480719 | | | | | |
| 370 | 0.7044532 | 0.7044529 | 0.9276108 | 0.6365536 | 0.2042949 | -0.2678407 | -0.1773515 | 0.4721456 | 0.2332587 | 0.4908826 | 0.7853981 | 1.9582672 |
| | 1.3483906 | 0.1701525 | 0.5679485 | 2.1089745 | 2.2788687 | 1.1833963 | 1.0469151 | | | | | |
| 371 | 0.7036341 | 0.7036338 | 0.9271398 | 0.6356270 | 0.2039752 | -0.2687737 | -0.1779470 | 0.4727689 | 0.2336220 | 0.4908826 | 0.7853981 | 1.9553061 |
| | 1.3468580 | 0.1705469 | 0.5675027 | 2.1090269 | 2.2793112 | 1.1824999 | 1.0457582 | | | | | |
| 372 | 0.7028134 | 0.7028131 | 0.9266670 | 0.6347003 | 0.2036555 | -0.2696921 | -0.1785706 | 0.4733975 | 0.2339867 | 0.4908826 | 0.7853981 | 1.9524212 |
| | 1.3453226 | 0.1709401 | 0.5670559 | 2.1090794 | 2.2797585 | 1.1816044 | 1.0445986 | | | | | |
| 373 | 0.7019944 | 0.7019941 | 0.9261931 | 0.6337733 | 0.2033358 | -0.2706293 | -0.1791825 | 0.4739651 | 0.2343484 | 0.4908826 | 0.7853981 | 1.9494534 |
| | 1.3437910 | 0.1713341 | 0.5666091 | 2.1091318 | 2.2802000 | 1.1807070 | 1.0434418 | | | | | |
| 374 | 0.7011732 | 0.7011729 | 0.9257186 | 0.6328467 | 0.2030161 | -0.2715421 | -0.1797765 | 0.4745582 | 0.2347107 | 0.4908826 | 0.7853981 | 1.9466095 |
| | 1.3422537 | 0.1717281 | 0.5661625 | 2.1091842 | 2.2806492 | 1.1798096 | 1.0422812 | | | | | |
| 375 | 0.7003526 | 0.7003523 | 0.9252451 | 0.6319196 | 0.2026964 | -0.2724735 | -0.1803663 | 0.4751699 | 0.2350737 | 0.4908826 | 0.7853981 | 1.9436836 |
| | 1.3407192 | 0.1721234 | 0.5657143 | 2.1092377 | 2.2810936 | 1.1789122 | 1.0411224 | | | | | |
| 376 | 0.6995299 | 0.6995296 | 0.9247692 | 0.6309926 | 0.2023767 | -0.2733984 | -0.1809634 | 0.4757650 | 0.2354358 | 0.4908826 | 0.7853981 | 1.9408426 |
| | 1.3391790 | 0.1725178 | 0.5652667 | 2.1092911 | 2.2815428 | 1.1780138 | 1.0399599 | | | | | |
| 377 | 0.6987107 | 0.6987104 | 0.9242930 | 0.6300656 | 0.2020569 | -0.2743224 | -0.1815529 | 0.4763793 | 0.2357954 | 0.4908826 | 0.7853981 | 1.9379187 |
| | 1.3376465 | 0.1729131 | 0.5648182 | 2.1093445 | 2.2819972 | 1.1771154 | 1.0388031 | | | | | |
| 378 | 0.6978911 | 0.6978908 | 0.9238173 | 0.6291385 | 0.2017372 | -0.2752587 | -0.1821358 | 0.4769959 | 0.2361557 | 0.4908826 | 0.7853981 | 1.9349899 |
| | 1.3361139 | 0.1733092 | 0.5643689 | 2.1093969 | 2.2824506 | 1.1762171 | 1.0376453 | | | | | |
| 379 | 0.6970684 | 0.6970686 | 0.9233396 | 0.6282114 | 0.2014176 | -0.2761753 | -0.1827017 | 0.4775929 | 0.2365158 | 0.4908826 | 0.7853981 | 1.9321604 |
| | 1.3345757 | 0.1737047 | 0.5639200 | 2.1094503 | 2.2829058 | 1.1753187 | 1.0364836 | | | | | |
| 380 | 0.6962475 | 0.6962472 | 0.9228613 | 0.6272845 | 0.2010978 | -0.2770973 | -0.1832633 | 0.4781951 | 0.2368748 | 0.4908826 | 0.7853981 | 1.9293137 |
| | 1.3330374 | 0.1741006 | 0.5634705 | 2.1095047 | 2.2833640 | 1.1744184 | 1.0353231 | | | | | |
| 381 | 0.6954238 | 0.6954235 | 0.9223832 | 0.6263573 | 0.2007781 | -0.2780137 | -0.1838206 | 0.4787918 | 0.2372356 | 0.4908826 | 0.7853981 | 1.9264994 |
| | 1.3314972 | 0.1744972 | 0.5630231 | 2.1095581 | 2.2838201 | 1.1735191 | 1.0341597 | | | | | |
| 382 | 0.6946026 | 0.6946023 | 0.9219031 | 0.6254300 | 0.2004584 | -0.2789408 | -0.1843751 | 0.4793942 | 0.2375926 | 0.4908826 | 0.7853981 | 1.9236412 |
| | 1.3299618 | 0.1748936 | 0.5625699 | 2.1096115 | 2.2842774 | 1.1726199 | 1.0330000 | | | | | |
| 383 | 0.6937806 | 0.6937801 | 0.9214231 | 0.6245027 | 0.2001387 | -0.2798678 | -0.1849273 | 0.4800033 | 0.2379506 | 0.4908826 | 0.7853981 | 1.9208050 |
| | 1.3284225 | 0.1752905 | 0.5621139 | 2.1096659 | 2.2847366 | 1.1717176 | 1.0318384 | | | | | |
| 384 | 0.6929589 | 0.6929586 | 0.9209430 | 0.6235752 | 0.1998190 | -0.2807939 | -0.1854731 | 0.4806129 | 0.2383082 | 0.4908826 | 0.7853981 | 1.9179497 |
| | 1.3268862 | 0.1756881 | 0.5616571 | 2.1097202 | 2.2851958 | 1.1708174 | 1.0306776 | | | | | |
| 385 | 0.6921346 | 0.6921343 | 0.9204620 | 0.6226477 | 0.1994992 | -0.2817206 | -0.1860179 | 0.4812258 | 0.2386667 | 0.4908826 | 0.7853981 | 1.9151783 |
| | 1.3253431 | 0.1760859 | 0.5612152 | 2.1097746 | 2.2856567 | 1.1699162 | 1.0295159 | | | | | |
| 386 | 0.6912128 | 0.6912126 | 0.9199800 | 0.6217206 | 0.1991796 | -0.2826480 | -0.1865619 | 0.4818426 | 0.2390224 | 0.4908826 | 0.7853981 | 1.9123259 |
| | 1.3238068 | 0.1764836 | 0.5607732 | 2.1098289 | 2.2861200 | 1.1690149 | 1.0283527 | | | | | |
| 387 | 0.6904913 | 0.6904910 | 0.9194962 | 0.6207932 | 0.1988599 | -0.2835755 | -0.1871078 | 0.4824634 | 0.2393764 | 0.4908826 | 0.7853981 | 1.9095078 |
| | 1.3223694 | 0.1768813 | 0.5603319 | 2.1098833 | 2.2865852 | 1.1681128 | 1.0271881 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 388 | 0.6896670 | 0.6896667 | 0.9190119 | 0.6198658 | 0.1985402-0.2844835-0.1882172 | 0.4830236 | 0.2397316 | 0.4908826 | 0.7853981 | 1.9067221 |
| | 1.3207273 | 0.1772788 | 0.5598586 | 2.1099377 | 2.2869263 1.1672087 1.0260277 | | | | | |
| 389 | 0.6888434 | 0.6888431 | 0.9185264 | 0.6189383 | 0.1982204-0.2854005-0.1888144 | 0.4836209 | 0.2400853 | 0.4908826 | 0.7853981 | 1.9039564 |
| | 1.3191862 | 0.1776767 | 0.5594059 | 2.1099930 | 2.2873793 1.1663055 1.0248042 | | | | | |
| 390 | 0.6880209 | 0.6880206 | 0.9180408 | 0.6180110 | 0.1979007-0.2863281-0.1894186 | 0.4842288 | 0.2404381 | 0.4908826 | 0.7853981 | 1.9011478 |
| | 1.3176479 | 0.1780752 | 0.5589525 | 2.1100473 | 2.2878244 1.1654024 1.0237126 | | | | | |
| 391 | 0.6871966 | 0.6871963 | 0.9175552 | 0.6170830 | 0.1975810-0.2872500-0.1900188 | 0.4848310 | 0.2407924 | 0.4908826 | 0.7853981 | 1.8983736 |
| | 1.3161058 | 0.1784745 | 0.5584980 | 2.1101027 | 2.2882614 1.1644983 1.0225482 | | | | | |
| 392 | 0.6863748 | 0.6863745 | 0.9170582 | 0.6161557 | 0.1972613-0.2881793-0.1906237 | 0.4854407 | 0.2411433 | 0.4908826 | 0.7853981 | 1.8955698 |
| | 1.3145685 | 0.1788734 | 0.5580440 | 2.1101580 | 2.2887306 1.1635942 1.0213776 | | | | | |
| 393 | 0.6855475 | 0.6855472 | 0.9165813 | 0.6152279 | 0.1969416-0.2890844-0.1912129 | 0.4860260 | 0.2414982 | 0.4908826 | 0.7853981 | 1.8928833 |
| | 1.3130207 | 0.1792731 | 0.5575899 | 2.1102133 | 2.2891993 1.1626902 1.0202084 | | | | | |
| 394 | 0.6847239 | 0.6847236 | 0.9160930 | 0.6143000 | 0.1966219-0.2900166-0.1918195 | 0.4866385 | 0.2418494 | 0.4908826 | 0.7853981 | 1.8900805 |
| | 1.3114835 | 0.1796729 | 0.5571336 | 2.1102686 | 2.2896695 1.1617842 1.0190458 | | | | | |
| 395 | 0.6839993 | 0.6838990 | 0.9156046 | 0.6133724 | 0.1963022-0.2909290-0.1924132 | 0.4872311 | 0.2422010 | 0.4908826 | 0.7853981 | 1.8873730 |
| | 1.3099365 | 0.1800731 | 0.5566778 | 2.1103249 | 2.2900963 1.1608801 1.0178826 | | | | | |
| 396 | 0.6830738 | 0.6830735 | 0.9151135 | 0.6124444 | 0.1959825-0.2918526-0.1930143 | 0.4878350 | 0.2425508 | 0.4908826 | 0.7853981 | 1.8846216 |
| | 1.3083935 | 0.1804727 | 0.5562222 | 2.1103832 | 2.2905483 1.1599722 1.0167150 | | | | | |
| 397 | 0.6822498 | 0.6822495 | 0.9146243 | 0.6115162 | 0.1956627-0.2927755-0.1936145 | 0.4884382 | 0.2429014 | 0.4908826 | 0.7853981 | 1.8818769 |
| | 1.3068514 | 0.1808741 | 0.5557650 | 2.1104364 | 2.2910032 1.1590672 1.0155506 | | | | | |
| 398 | 0.6814253 | 0.6814250 | 0.9141331 | 0.6105887 | 0.1953431-0.2936927-0.1942112 | 0.4890358 | 0.2432503 | 0.4908826 | 0.7853981 | 1.8791676 |
| | 1.3053083 | 0.1812746 | 0.5553085 | 2.1104927 | 2.2914541 1.1581612 1.0143862 | | | | | |
| 399 | 0.6805980 | 0.6805977 | 0.9136412 | 0.6096605 | 0.1950234-0.2946040-0.1948037 | 0.4896274 | 0.2436005 | 0.4908826 | 0.7853981 | 1.8764906 |
| | 1.3037596 | 0.1816759 | 0.5548519 | 2.1105490 | 2.2919168 1.1572533 1.0132173 | | | | | |
| 400 | 0.6797745 | 0.6797742 | 0.9131494 | 0.6087325 | 0.1947036-0.2955343-0.1954085 | 0.4902379 | 0.2439483 | 0.4908826 | 0.7853981 | 1.8737335 |
| | 1.3022201 | 0.1820776 | 0.5543929 | 2.1106052 | 2.2923889 1.1563463 1.0120544 | | | | | |
| 401 | 0.6789473 | 0.6789470 | 0.9126555 | 0.6078046 | 0.1943839-0.2964654-0.1960039 | 0.4908293 | 0.2442964 | 0.4908826 | 0.7853981 | 1.8710680 |
| | 1.3006725 | 0.1824789 | 0.5539352 | 2.1106615 | 2.2928276 1.1554384 1.0108862 | | | | | |
| 402 | 0.6781188 | 0.6781185 | 0.9121603 | 0.6068763 | 0.1940642-0.2973962-0.1965935 | 0.4914204 | 0.2446444 | 0.4908826 | 0.7853981 | 1.8684111 |
| | 1.2991213 | 0.1828802 | 0.5534770 | 2.1107178 | 2.2932673 1.1545286 1.0097151 | | | | | |
| 403 | 0.6772944 | 0.6772941 | 0.9116664 | 0.6059481 | 0.1937445-0.2982852-0.1971965 | 0.4920297 | 0.2449908 | 0.4908826 | 0.7853981 | 1.8656778 |
| | 1.2975807 | 0.1832829 | 0.5530175 | 2.1107750 | 2.2937412 1.1536207 1.0085515 | | | | | |
| 404 | 0.6764674 | 0.6764671 | 0.9111710 | 0.6050199 | 0.1934248-0.2991931-0.1977866 | 0.4926179 | 0.2453375 | 0.4908826 | 0.7853981 | 1.8630447 |
| | 1.2960320 | 0.1836854 | 0.5525581 | 2.1108322 | 2.2942219 1.1527119 1.0073824 | | | | | |
| 405 | 0.6756409 | 0.6756406 | 0.9106743 | 0.6040918 | 0.1931051-0.3001162-0.1983863 | 0.4932213 | 0.2456826 | 0.4908826 | 0.7853981 | 1.8603497 |
| | 1.2944870 | 0.1840877 | 0.5520985 | 2.1108892 | 2.2946577 1.1518021 1.0062151 | | | | | |
| 406 | 0.6748154 | 0.6748151 | 0.9101772 | 0.6031635 | 0.1927854-0.3010423-0.1989678 | 0.4938276 | 0.2460267 | 0.4908826 | 0.7853981 | 1.8576479 |
| | 1.2929430 | 0.1844909 | 0.5516383 | 2.1109457 | 2.2951136 1.1508923 1.0050497 | | | | | |
| 407 | 0.6739876 | 0.6739873 | 0.9096787 | 0.6022350 | 0.1924657-0.3019570-0.1995419 | 0.4944227 | 0.2463710 | 0.4908826 | 0.7853981 | 1.8550034 |
| | 1.2913942 | 0.1848940 | 0.5511779 | 2.1110039 | 2.2955732 1.1499815 1.0038835 | | | | | |
| 408 | 0.6731604 | 0.6731601 | 0.9091804 | 0.6013067 | 0.1921459-0.3028739-0.2001771 | 0.4950199 | 0.2467151 | 0.4908826 | 0.7853981 | 1.8523540 |
| | 1.2898474 | 0.1852975 | 0.5507168 | 2.1110611 | 2.2960320 1.1490707 1.0027122 | | | | | |
| 409 | 0.6723321 | 0.6723318 | 0.9086800 | 0.6003781 | 0.1918262-0.3037883-0.2007709 | 0.4956145 | 0.2470580 | 0.4908826 | 0.7853981 | 1.8497219 |
| | 1.2882967 | 0.1857010 | 0.5502556 | 2.1111193 | 2.2964926 1.1481581 1.0015421 | | | | | |
| 410 | 0.6715053 | 0.6715047 | 0.9081803 | 0.5994494 | 0.1915065-0.3047051-0.2013661 | 0.4962116 | 0.2474008 | 0.4908826 | 0.7853981 | 1.8470840 |
| | 1.2867498 | 0.1861055 | 0.5497933 | 2.1111765 | 2.2969522 1.1472473 1.0003738 | | | | | |
| 411 | 0.6706767 | 0.6706764 | 0.9076798 | 0.5985208 | 0.1911868-0.3056212-0.2019606 | 0.4968081 | 0.2477436 | 0.4908826 | 0.7853981 | 1.8444557 |
| | 1.2852001 | 0.1865103 | 0.5493308 | 2.1112347 | 2.2974129 1.1463346 0.9992043 | | | | | |
| 412 | 0.6698495 | 0.6698492 | 0.9071793 | 0.5975922 | 0.1908671-0.3065373-0.2025550 | 0.4974044 | 0.2480857 | 0.4908826 | 0.7853981 | 1.8418341 |
| | 1.2836523 | 0.1869152 | 0.5488675 | 2.1112928 | 2.2978745 1.1454239 0.9980355 | | | | | |
| 413 | 0.6690212 | 0.6690209 | 0.9066771 | 0.5966634 | 0.1905474-0.3074558-0.2031510 | 0.4980032 | 0.2484269 | 0.4908826 | 0.7853981 | 1.8392067 |
| | 1.2821035 | 0.1873203 | 0.5484042 | 2.1113510 | 2.2983351 1.1445112 0.9968657 | | | | | |
| 414 | 0.6681901 | 0.6681898 | 0.9061736 | 0.5957345 | 0.1902277-0.3083605-0.2037374 | 0.4985882 | 0.2487689 | 0.4908826 | 0.7853981 | 1.8366451 |
| | 1.2805481 | 0.1877254 | 0.5479405 | 2.1114092 | 2.2987955 1.1435966 0.9956917 | | | | | |
| 415 | 0.6673638 | 0.6673635 | 0.9056699 | 0.5948058 | 0.1899080-0.3092894-0.2043403 | 0.4991974 | 0.2491083 | 0.4908826 | 0.7853981 | 1.8339844 |
| | 1.2790022 | 0.1881306 | 0.5474768 | 2.1114683 | 2.2992573 1.1426821 0.9945247 | | | | | |
| 416 | 0.6665339 | 0.6665336 | 0.9051654 | 0.5938768 | 0.1895882-0.3102015-0.2049317 | 0.4997897 | 0.2494464 | 0.4908826 | 0.7853981 | 1.8314028 |
| | 1.2774496 | 0.1885365 | 0.5470131 | 2.1115265 | 2.2997217 1.1417685 0.9933529 | | | | | |
| 417 | 0.6657051 | 0.6657047 | 0.9046586 | 0.5929476 | 0.1892685-0.3111148-0.2055265 | 0.5003873 | 0.2497848 | 0.4908826 | 0.7853981 | 1.8288040 |
| | 1.2758999 | 0.1889427 | 0.5465471 | 2.1115856 | 2.3001833 1.1408529 0.9921810 | | | | | |
| 418 | 0.6648756 | 0.6648753 | 0.9041539 | 0.5920188 | 0.1889489-0.3120329-0.2061191 | 0.5009818 | 0.2501235 | 0.4908826 | 0.7853981 | 1.8262234 |
| | 1.2743473 | 0.1893492 | 0.5460815 | 2.1116447 | 2.3006477 1.1399384 0.9910101 | | | | | |
| 419 | 0.6640459 | 0.6640456 | 0.9036459 | 0.5910895 | 0.1886274-0.3129472-0.2067117 | 0.5015764 | 0.2504613 | 0.4908826 | 0.7853981 | 1.8236485 |
| | 1.2727957 | 0.1897560 | 0.5456155 | 2.1117039 | 2.3011112 1.1390228 0.9898383 | | | | | |
| 420 | 0.6632153 | 0.6632150 | 0.9031330 | 0.5901603 | 0.1883094-0.3138583-0.2073022 | 0.5021678 | 0.2507994 | 0.4908826 | 0.7853981 | 1.8210936 |
| | 1.2712412 | 0.1901634 | 0.5451497 | 2.1117630 | 2.3015746 1.1381073 0.9886652 | | | | | |
| 421 | 0.6623850 | 0.6623847 | 0.9026292 | 0.5892312 | 0.1879897-0.3147681-0.2078922 | 0.5027588 | 0.2511348 | 0.4908826 | 0.7853981 | 1.8185444 |
| | 1.2696877 | 0.1905700 | 0.5446826 | 2.1118231 | 2.3020420 1.1371879 0.9874924 | | | | | |
| 422 | 0.6615544 | 0.6615541 | 0.9021236 | 0.5883020 | 0.1876700-0.3156850-0.2084755 | 0.5033550 | 0.2514716 | 0.4908826 | 0.7853981 | 1.8159790 |
| | 1.2681341 | 0.1909774 | 0.5442151 | 2.1118822 | 2.3025074 1.1362734 0.9863191 | | | | | |
| 423 | 0.6607231 | 0.6607228 | 0.9016117 | 0.5873721 | 0.1873503-0.3166052-0.2090571 | 0.5039455 | 0.2518078 | 0.4908826 | 0.7853981 | 1.8134451 |
| | 1.2665787 | 0.1913861 | 0.5437469 | 2.1119423 | 2.3029747 1.1353589 0.9851450 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 424 | 0.6598939 | 0.6598936 | 0.9010990 | 0.5864431 | 0.1870306 | -0.3175157 | -0.2096712 | 0.5045463 | 0.2521405 | 0.4908826 | 0.7853981 | 1.8108711 |
| | 1.2650280 | 0.1917936 | 0.5432795 | 2.1120024 | 2.3034372 | 1.1344376 | 0.9839745 | | | | | |
| 425 | 0.6590613 | 0.6590610 | 0.9305871 | 0.5855134 | 0.1867109 | -0.3184199 | -0.2102566 | 0.5051308 | 0.2524756 | 0.4908826 | 0.7853981 | 1.8083725 |
| | 1.2634697 | 0.1922020 | 0.5428108 | 2.1120625 | 2.3039064 | 1.1335182 | 0.9827979 | | | | | |
| 426 | 0.6582306 | 0.6582303 | 0.9000748 | 0.5845839 | 0.1863912 | -0.3193373 | -0.2108505 | 0.5057285 | 0.2528089 | 0.4908826 | 0.7853981 | 1.8058233 |
| | 1.2619162 | 0.1926107 | 0.5423414 | 2.1121225 | 2.3043718 | 1.1325998 | 0.9816246 | | | | | |
| 427 | 0.6573993 | 0.6573990 | 0.8995612 | 0.5836545 | 0.1860715 | -0.3202491 | -0.2114437 | 0.5063206 | 0.2531415 | 0.4908826 | 0.7853981 | 1.8033028 |
| | 1.2603607 | 0.1930195 | 0.5418724 | 2.1121836 | 2.3048391 | 1.1316805 | 0.9804505 | | | | | |
| 428 | 0.6565663 | 0.6565660 | 0.8990477 | 0.5827245 | 0.1857517 | -0.3211552 | -0.2120279 | 0.5069069 | 0.2534754 | 0.4908826 | 0.7853981 | 1.8006118 |
| | 1.2584024 | 0.1934292 | 0.5414022 | 2.1122437 | 2.3053093 | 1.1307611 | 0.9792738 | | | | | |
| 429 | 0.6557357 | 0.6557354 | 0.8985341 | 0.5817944 | 0.1854320 | -0.3220718 | -0.2126201 | 0.5075038 | 0.2538077 | 0.4908826 | 0.7853981 | 1.7982826 |
| | 1.2572479 | 0.1938397 | 0.5409310 | 2.1123047 | 2.3057766 | 1.1298418 | 0.9781008 | | | | | |
| 430 | 0.6549031 | 0.6549028 | 0.8980191 | 0.5808647 | 0.1851124 | -0.3229830 | -0.2132077 | 0.5080924 | 0.2541397 | 0.4908826 | 0.7853981 | 1.7957926 |
| | 1.2556906 | 0.1942497 | 0.5404599 | 2.1123657 | 2.3062468 | 1.1289215 | 0.9769247 | | | | | |
| 431 | 0.6540703 | 0.6540703 | 0.8975036 | 0.5799346 | 0.1847926 | -0.3238904 | -0.2137964 | 0.5086830 | 0.2544716 | 0.4908826 | 0.7853981 | 1.7933006 |
| | 1.2541323 | 0.1946605 | 0.5399880 | 2.1124268 | 2.3067169 | 1.1280012 | 0.9757435 | | | | | |
| 432 | 0.6532372 | 0.6532369 | 0.8969871 | 0.5790043 | 0.1844729 | -0.3248005 | -0.2143849 | 0.5092734 | 0.2548028 | 0.4908826 | 0.7853981 | 1.7908134 |
| | 1.2525740 | 0.1950715 | 0.5395157 | 2.1124878 | 2.3071871 | 1.1270830 | 0.9745718 | | | | | |
| 433 | 0.6524040 | 0.6524037 | 0.8964698 | 0.5780742 | 0.1841532 | -0.3257107 | -0.2149734 | 0.5098639 | 0.2551333 | 0.4908826 | 0.7853981 | 1.7883320 |
| | 1.2510157 | 0.1954827 | 0.5390430 | 2.1125498 | 2.3076582 | 1.1261647 | 0.9733950 | | | | | |
| 434 | 0.6515701 | 0.6515699 | 0.8959518 | 0.5771440 | 0.1838335 | -0.3266121 | -0.2155561 | 0.5104455 | 0.2554635 | 0.4908826 | 0.7853981 | 1.7858934 |
| | 1.2494545 | 0.1958942 | 0.5385699 | 2.1126118 | 2.3081322 | 1.1252465 | 0.9722172 | | | | | |
| 435 | 0.6507379 | 0.6507376 | 0.8954317 | 0.5762136 | 0.1835138 | -0.3275295 | -0.2161493 | 0.5110433 | 0.2557907 | 0.4908826 | 0.7853981 | 1.7833920 |
| | 1.2478981 | 0.1963055 | 0.5380968 | 2.1126728 | 2.3086004 | 1.1243134 | 0.9710420 | | | | | |
| 436 | 0.6499043 | 0.6499040 | 0.8949112 | 0.5752832 | 0.1831940 | -0.3284441 | -0.2167431 | 0.5116382 | 0.2561183 | 0.4908826 | 0.7853981 | 1.7809076 |
| | 1.2463388 | 0.1967177 | 0.5376231 | 2.1127348 | 2.3090706 | 1.1233892 | 0.9698645 | | | | | |
| 437 | 0.6490704 | 0.6490701 | 0.8943906 | 0.5743533 | 0.1828744 | -0.3293500 | -0.2173354 | 0.5122244 | 0.2564460 | 0.4908826 | 0.7853981 | 1.7784643 |
| | 1.2447786 | 0.1971292 | 0.5371440 | 2.1127968 | 2.3095436 | 1.1224661 | 0.9686867 | | | | | |
| 438 | 0.6482356 | 0.6482353 | 0.8938687 | 0.5734224 | 0.1825547 | -0.3302532 | -0.2179289 | 0.5128079 | 0.2567734 | 0.4908826 | 0.7853981 | 1.7760372 |
| | 1.2432165 | 0.1975419 | 0.5366740 | 2.1128587 | 2.3100165 | 1.1215420 | 0.9675078 | | | | | |
| 439 | 0.6474034 | 0.6474031 | 0.8933467 | 0.5724921 | 0.1822349 | -0.3311720 | -0.2185022 | 0.5134069 | 0.2570987 | 0.4908826 | 0.7853981 | 1.7735519 |
| | 1.2416601 | 0.1979548 | 0.5361987 | 2.1129217 | 2.3104877 | 1.1206179 | 0.9663325 | | | | | |
| 440 | 0.6465664 | 0.6465661 | 0.8928236 | 0.5715611 | 0.1819152 | -0.3320721 | -0.2190835 | 0.5139873 | 0.2574263 | 0.4908826 | 0.7853981 | 1.7711477 |
| | 1.2400932 | 0.1983682 | 0.5357226 | 2.1129847 | 2.3109655 | 1.1196918 | 0.9651502 | | | | | |
| 441 | 0.6457320 | 0.6457317 | 0.8922999 | 0.5706305 | 0.1815955 | -0.3329821 | -0.2196710 | 0.5145776 | 0.2577516 | 0.4908826 | 0.7853981 | 1.7687082 |
| | 1.2385330 | 0.1987817 | 0.5352463 | 2.1130476 | 2.3114486 | 1.1187668 | 0.9639717 | | | | | |
| 442 | 0.6448973 | 0.6448971 | 0.8917754 | 0.5696997 | 0.1812758 | -0.3338866 | -0.2202548 | 0.5151624 | 0.2580767 | 0.4908826 | 0.7853981 | 1.7662973 |
| | 1.2369709 | 0.1991958 | 0.5347692 | 2.1131105 | 2.3119144 | 1.1178417 | 0.9627931 | | | | | |
| 443 | 0.6440620 | 0.6440617 | 0.8912498 | 0.5687689 | 0.1809561 | -0.3347991 | -0.2208438 | 0.5157552 | 0.2584003 | 0.4908826 | 0.7853981 | 1.7638578 |
| | 1.2354088 | 0.1996097 | 0.5342922 | 2.1131735 | 2.3123884 | 1.1169147 | 0.9616132 | | | | | |
| 444 | 0.6432259 | 0.6432256 | 0.8907236 | 0.5678378 | 0.1806364 | -0.3357056 | -0.2214287 | 0.5163420 | 0.2587246 | 0.4908826 | 0.7853981 | 1.7614479 |
| | 1.2338448 | 0.2000243 | 0.5338142 | 2.1132364 | 2.3128643 | 1.1159878 | 0.9604323 | | | | | |
| 445 | 0.6423894 | 0.6423891 | 0.8901957 | 0.5669068 | 0.1803167 | -0.3366094 | -0.2220119 | 0.5169261 | 0.2590473 | 0.4908826 | 0.7853981 | 1.7590532 |
| | 1.2322798 | 0.2004386 | 0.5333363 | 2.1133003 | 2.3133411 | 1.1150599 | 0.9592508 | | | | | |
| 446 | 0.6415531 | 0.6415529 | 0.8896672 | 0.5659757 | 0.1799970 | -0.3375155 | -0.2225963 | 0.5175124 | 0.2593693 | 0.4908826 | 0.7853981 | 1.7566557 |
| | 1.2307148 | 0.2008535 | 0.5328578 | 2.1133642 | 2.3138180 | 1.1141319 | 0.9580697 | | | | | |
| 447 | 0.6407182 | 0.6407179 | 0.8891390 | 0.5650446 | 0.1796772 | -0.3384235 | -0.2231817 | 0.5181007 | 0.2596908 | 0.4908826 | 0.7853981 | 1.7542543 |
| | 1.2291527 | 0.2012698 | 0.5323784 | 2.1134281 | 2.3142959 | 1.1132040 | 0.9568906 | | | | | |
| 448 | 0.6398802 | 0.6398799 | 0.8886105 | 0.5641131 | 0.1793575 | -0.3393291 | -0.2237657 | 0.5186866 | 0.2600141 | 0.4908826 | 0.7853981 | 1.7518682 |
| | 1.2275858 | 0.2016853 | 0.5318991 | 2.1134920 | 2.3147726 | 1.1122751 | 0.9557070 | | | | | |
| 449 | 0.6390430 | 0.6390427 | 0.8880795 | 0.5631815 | 0.1790378 | -0.3402316 | -0.2243475 | 0.5192694 | 0.2603345 | 0.4908826 | 0.7853981 | 1.7494984 |
| | 1.2260189 | 0.2021012 | 0.5314179 | 2.1135559 | 2.3152514 | 1.1113453 | 0.9545247 | | | | | |
| 450 | 0.6382072 | 0.6382069 | 0.8875449 | 0.5622503 | 0.1787181 | -0.3411418 | -0.2249292 | 0.5198593 | 0.2606543 | 0.4908826 | 0.7853981 | 1.7471037 |
| | 1.2244549 | 0.2025175 | 0.5309371 | 2.1136209 | 2.3157291 | 1.1104164 | 0.9533443 | | | | | |
| 451 | 0.6373691 | 0.6373688 | 0.8870178 | 0.5613185 | 0.1783984 | -0.3420516 | -0.2255134 | 0.5204421 | 0.2609754 | 0.4908826 | 0.7853981 | 1.7447462 |
| | 1.2228870 | 0.2029349 | 0.5304552 | 2.1136856 | 2.3162098 | 1.1094866 | 0.9521637 | | | | | |
| 452 | 0.6365332 | 0.6365329 | 0.8864850 | 0.5603864 | 0.1780787 | -0.3429585 | -0.2260988 | 0.5210372 | 0.2612931 | 0.4908826 | 0.7853981 | 1.7423429 |
| | 1.2213240 | 0.2033520 | 0.5299735 | 2.1137495 | 2.3166857 | 1.1085558 | 0.9509832 | | | | | |
| 453 | 0.6356943 | 0.6356941 | 0.8859511 | 0.5594550 | 0.1777590 | -0.3438654 | -0.2266842 | 0.5216134 | 0.2616127 | 0.4908826 | 0.7853981 | 1.7400188 |
| | 1.2197533 | 0.2037696 | 0.5294919 | 2.1138153 | 2.3171616 | 1.1076250 | 0.9498024 | | | | | |
| 454 | 0.6348564 | 0.6348561 | 0.8854141 | 0.5585228 | 0.1774393 | -0.3447697 | -0.2272697 | 0.5222000 | 0.2619311 | 0.4908826 | 0.7853981 | 1.7376595 |
| | 1.2181864 | 0.2041878 | 0.5290076 | 2.1138802 | 2.3176398 | 1.1066934 | 0.9486220 | | | | | |
| 455 | 0.6340172 | 0.6340169 | 0.8848766 | 0.5575906 | 0.1771196 | -0.3456739 | -0.2278553 | 0.5227835 | 0.2622505 | 0.4908826 | 0.7853981 | 1.7353277 |
| | 1.2166166 | 0.2046067 | 0.5285232 | 2.1139450 | 2.3181179 | 1.1057625 | 0.9474407 | | | | | |
| 456 | 0.6331809 | 0.6331806 | 0.8843393 | 0.5566585 | 0.1767999 | -0.3465781 | -0.2284415 | 0.5233745 | 0.2625665 | 0.4908826 | 0.7853981 | 1.7329483 |
| | 1.2150517 | 0.2050257 | 0.5280390 | 2.1140100 | 2.3185971 | 1.1048317 | 0.9462597 | | | | | |
| 457 | 0.6322131 | 0.6322124 | 0.8838127 | 0.5557267 | 0.1764802 | -0.3474824 | -0.2290252 | 0.5239520 | 0.2628845 | 0.4908826 | 0.7853981 | 1.7330360 |
| | 1.2132906 | 0.2054362 | 0.5275549 | 2.1140662 | 2.3188042 | 1.1038940 | 0.9450784 | | | | | |
| 458 | 0.6314964 | 0.6314961 | 0.8833754 | 0.5547943 | 0.1761605 | -0.3483867 | -0.2295749 | 0.5245361 | 0.2632031 | 0.4908826 | 0.7853981 | 1.7284184 |
| | 1.2118994 | 0.2058634 | 0.5270574 | 2.1141424 | 2.3195687 | 1.1029564 | 0.9438967 | | | | | |
| 459 | 0.6305328 | 0.6305325 | 0.8828344 | 0.5538614 | 0.1758407 | -0.3492905 | -0.2301593 | 0.5251192 | 0.2635220 | 0.4908826 | 0.7853981 | 1.7263907 |
| | 1.2103973 | 0.2062741 | 0.5265828 | 2.1142187 | 2.3200782 | 1.1020186 | 0.9427156 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 460 | 0.6296918 | 0.6296915 | 0.8821999 | 0.5529289 | 0.1755210 | -0.3495686 | -0.2303604 | 0.5250896 | 0.2639180 | 0.4908826 | 0.7853981 | 1.7261019 |
| | 1.2085247 | 0.2066938 | 0.5263967 | 2.1142845 | 2.3207655 | 1.1010971 | 0.9413183 | | | | | |
| 461 | 0.6288500 | 0.6288497 | 0.8816609 | 0.5519964 | 0.1752013 | -0.3504621 | -0.2309351 | 0.5256634 | 0.2642342 | 0.4908826 | 0.7853981 | 1.7238216 |
| | 1.2069492 | 0.2071142 | 0.5256098 | 2.1143513 | 2.3212538 | 1.1001625 | 0.9401293 | | | | | |
| 462 | 0.6283105 | 0.6283102 | 0.8811326 | 0.5510636 | 0.1748816 | -0.3513659 | -0.2315164 | 0.5262475 | 0.2645496 | 0.4908826 | 0.7853981 | 1.7215033 |
| | 1.2053785 | 0.2075359 | 0.5251215 | 2.1144180 | 2.3217392 | 1.0992289 | 0.9389437 | | | | | |
| 463 | 0.6271694 | 0.6271691 | 0.8805824 | 0.5501305 | 0.1745619 | -0.3522643 | -0.2320942 | 0.5268263 | 0.2648641 | 0.4908826 | 0.7853981 | 1.7192116 |
| | 1.2038059 | 0.2079576 | 0.5246329 | 2.1144848 | 2.3222265 | 1.0982943 | 0.9377559 | | | | | |
| 464 | 0.6263275 | 0.6263272 | 0.8800408 | 0.5491973 | 0.1742422 | -0.3531623 | -0.2326714 | 0.5274045 | 0.2651781 | 0.4908826 | 0.7853981 | 1.7169266 |
| | 1.2022305 | 0.2083793 | 0.5241441 | 2.1145515 | 2.3227148 | 1.0973577 | 0.9365659 | | | | | |
| 465 | 0.6254862 | 0.6254859 | 0.8794992 | 0.5482645 | 0.1739225 | -0.3540570 | -0.2332464 | 0.5279795 | 0.2654914 | 0.4908826 | 0.7853981 | 1.7146597 |
| | 1.2006559 | 0.2088016 | 0.5236547 | 2.1146193 | 2.3232040 | 1.0964222 | 0.9353747 | | | | | |
| 466 | 0.6246439 | 0.6246436 | 0.8789557 | 0.5473311 | 0.1736028 | -0.3549548 | -0.2338235 | 0.5285575 | 0.2658038 | 0.4908826 | 0.7853981 | 1.7123842 |
| | 1.1990805 | 0.2092239 | 0.5231649 | 2.1146870 | 2.3236923 | 1.0954847 | 0.9341893 | | | | | |
| 467 | 0.6238037 | 0.6238034 | 0.8784133 | 0.5463976 | 0.1732830 | -0.3558572 | -0.2344034 | 0.5291402 | 0.2661158 | 0.4908826 | 0.7853981 | 1.7100954 |
| | 1.1975088 | 0.2096475 | 0.5226737 | 2.1147537 | 2.3241806 | 1.0945492 | 0.9330028 | | | | | |
| 468 | 0.6229612 | 0.6229609 | 0.8778669 | 0.5454643 | 0.1729633 | -0.3567513 | -0.2349777 | 0.5297146 | 0.2664276 | 0.4908826 | 0.7853981 | 1.7078438 |
| | 1.1959314 | 0.2100706 | 0.5221878 | 2.1148224 | 2.3246717 | 1.0936117 | 0.9318129 | | | | | |
| 469 | 0.6221191 | 0.6221188 | 0.8773240 | 0.5445307 | 0.1726437 | -0.3576553 | -0.2355543 | 0.5302990 | 0.2667385 | 0.4908826 | 0.7853981 | 1.7055559 |
| | 1.1943569 | 0.2104945 | 0.5216910 | 2.1148901 | 2.3251606 | 1.0926733 | 0.9306237 | | | | | |
| 470 | 0.6212754 | 0.6212751 | 0.8767771 | 0.5435973 | 0.1723239 | -0.3585636 | -0.2361287 | 0.5308675 | 0.2670485 | 0.4908826 | 0.7853981 | 1.7033358 |
| | 1.1927786 | 0.2109178 | 0.5211993 | 2.1149578 | 2.3256531 | 1.0917349 | 0.9294322 | | | | | |
| 471 | 0.6204326 | 0.6204323 | 0.8762302 | 0.5426637 | 0.1720042 | -0.3594721 | -0.2367056 | 0.5314463 | 0.2673581 | 0.4908826 | 0.7853981 | 1.7010803 |
| | 1.1912022 | 0.2113421 | 0.5207067 | 2.1150265 | 2.3261442 | 1.0907955 | 0.9282414 | | | | | |
| 472 | 0.6195900 | 0.6195897 | 0.8756826 | 0.5417297 | 0.1716845 | -0.3603827 | -0.2372837 | 0.5320272 | 0.2676668 | 0.4908826 | 0.7853981 | 1.6988211 |
| | 1.1896257 | 0.2117670 | 0.5202133 | 2.1150951 | 2.3266344 | 1.0898561 | 0.9270522 | | | | | |
| 473 | 0.6187457 | 0.6187454 | 0.8751336 | 0.5407957 | 0.1713648 | -0.3612951 | -0.2378563 | 0.5325999 | 0.2679754 | 0.4908826 | 0.7853981 | 1.6965981 |
| | 1.1880465 | 0.2121918 | 0.5197197 | 2.1151638 | 2.3271284 | 1.0889158 | 0.9258587 | | | | | |
| 474 | 0.6179017 | 0.6179014 | 0.8745852 | 0.5398617 | 0.1710451 | -0.3622100 | -0.2384306 | 0.5331751 | 0.2682843 | 0.4908826 | 0.7853981 | 1.6943693 |
| | 1.1864662 | 0.2126175 | 0.5192249 | 2.1152334 | 2.3276224 | 1.0879755 | 0.9246679 | | | | | |
| 475 | 0.6170577 | 0.6170574 | 0.8740348 | 0.5389279 | 0.1707254 | -0.3631246 | -0.2390046 | 0.5337500 | 0.2685914 | 0.4908826 | 0.7853981 | 1.6921453 |
| | 1.1848888 | 0.2130429 | 0.5187303 | 2.1153021 | 2.3281155 | 1.0870342 | 0.9234760 | | | | | |
| 476 | 0.6162132 | 0.6162129 | 0.8734842 | 0.5379934 | 0.1704057 | -0.3639215 | -0.2395798 | 0.5343271 | 0.2688988 | 0.4908826 | 0.7853981 | 1.6899185 |
| | 1.1833086 | 0.2134694 | 0.5182344 | 2.1153717 | 2.3286095 | 1.0860929 | 0.9222834 | | | | | |
| 477 | 0.6153690 | 0.6153687 | 0.8729314 | 0.5370591 | 0.1700860 | -0.3648180 | -0.2401547 | 0.5349039 | 0.2692038 | 0.4908826 | 0.7853981 | 1.6876965 |
| | 1.1817293 | 0.2138954 | 0.5177389 | 2.1154413 | 2.3291035 | 1.0851507 | 0.9210913 | | | | | |
| 478 | 0.6145232 | 0.6145229 | 0.8723784 | 0.5361247 | 0.1697662 | -0.3657061 | -0.2407240 | 0.5354723 | 0.2695096 | 0.4908826 | 0.7853981 | 1.6855106 |
| | 1.1801462 | 0.2143220 | 0.5172424 | 2.1155109 | 2.3296013 | 1.0842075 | 0.9198968 | | | | | |
| 479 | 0.6136786 | 0.6136783 | 0.8718249 | 0.5351901 | 0.1694465 | -0.3666049 | -0.2413003 | 0.5360515 | 0.2698145 | 0.4908826 | 0.7853981 | 1.6832886 |
| | 1.1785669 | 0.2147493 | 0.5167452 | 2.1155806 | 2.3300953 | 1.0832644 | 0.9187042 | | | | | |
| 480 | 0.6128337 | 0.6128334 | 0.8712705 | 0.5342553 | 0.1691268 | -0.3674975 | -0.2418722 | 0.5366243 | 0.2701185 | 0.4908826 | 0.7853981 | 1.6810951 |
| | 1.1769857 | 0.2151769 | 0.5162473 | 2.1156511 | 2.3305922 | 1.0823212 | 0.9175110 | | | | | |
| 481 | 0.6119878 | 0.6119875 | 0.8707165 | 0.5333205 | 0.1688071 | -0.3683928 | -0.2424459 | 0.5371999 | 0.2704237 | 0.4908826 | 0.7853981 | 1.6788950 |
| | 1.1754036 | 0.2156055 | 0.5157487 | 2.1157217 | 2.3310890 | 1.0813780 | 0.9163164 | | | | | |
| 482 | 0.6111426 | 0.6111423 | 0.8701611 | 0.5323855 | 0.1684874 | -0.3692905 | -0.2430211 | 0.5377780 | 0.2707271 | 0.4908826 | 0.7853981 | 1.6766891 |
| | 1.1738224 | 0.2160342 | 0.5152491 | 2.1157923 | 2.3315859 | 1.0804338 | 0.9151230 | | | | | |
| 483 | 0.6102967 | 0.6102964 | 0.8696048 | 0.5314505 | 0.1681677 | -0.3701868 | -0.2435938 | 0.5383525 | 0.2710301 | 0.4908826 | 0.7853981 | 1.6745014 |
| | 1.1722431 | 0.2164631 | 0.5147493 | 2.1158629 | 2.3320837 | 1.0794888 | 0.9139284 | | | | | |
| 484 | 0.6094488 | 0.6094485 | 0.8690488 | 0.5305151 | 0.1678480 | -0.3710859 | -0.2441579 | 0.5389138 | 0.2713349 | 0.4908826 | 0.7853981 | 1.6723690 |
| | 1.1706524 | 0.2168931 | 0.5142482 | 2.1159344 | 2.3325872 | 1.0785446 | 0.9127311 | | | | | |
| 485 | 0.6086020 | 0.6086017 | 0.8684916 | 0.5295795 | 0.1675283 | -0.3719859 | -0.2447204 | 0.5394682 | 0.2716377 | 0.4908826 | 0.7853981 | 1.6701899 |
| | 1.1690693 | 0.2173234 | 0.5137466 | 2.1160059 | 2.3330870 | 1.0775995 | 0.9115353 | | | | | |
| 486 | 0.6077544 | 0.6077545 | 0.8679336 | 0.5286440 | 0.1672086 | -0.3728856 | -0.2452824 | 0.5400621 | 0.2719401 | 0.4908826 | 0.7853981 | 1.6680164 |
| | 1.1674843 | 0.2177541 | 0.5132445 | 2.1160765 | 2.3335876 | 1.0766535 | 0.9103389 | | | | | |
| 487 | 0.6069084 | 0.6069081 | 0.8673746 | 0.5277081 | 0.1668888 | -0.3737846 | -0.2458358 | 0.5406384 | 0.2722411 | 0.4908826 | 0.7853981 | 1.6658392 |
| | 1.1659012 | 0.2181852 | 0.5127417 | 2.1161480 | 2.3340874 | 1.0757074 | 0.9091436 | | | | | |
| 488 | 0.6060613 | 0.6060610 | 0.8668148 | 0.5267725 | 0.1665692 | -0.3746835 | -0.2463891 | 0.5412066 | 0.2725416 | 0.4908826 | 0.7853981 | 1.6636887 |
| | 1.1643162 | 0.2186164 | 0.5122387 | 2.1162205 | 2.3345890 | 1.0747604 | 0.9079475 | | | | | |
| 489 | 0.6052131 | 0.6052128 | 0.8662550 | 0.5258365 | 0.1662495 | -0.3755821 | -0.2469419 | 0.5417766 | 0.2728432 | 0.4908826 | 0.7853981 | 1.6615505 |
| | 1.1627293 | 0.2190486 | 0.5117344 | 2.1162929 | 2.3350935 | 1.0738134 | 0.9067498 | | | | | |
| 490 | 0.6043652 | 0.6043649 | 0.8656934 | 0.5249004 | 0.1659297 | -0.3764792 | -0.2474934 | 0.5423489 | 0.2731426 | 0.4908826 | 0.7853981 | 1.6594309 |
| | 1.1611423 | 0.2194807 | 0.5112301 | 2.1163645 | 2.3355961 | 1.0728664 | 0.9055523 | | | | | |
| 491 | 0.6035156 | 0.6035153 | 0.8651305 | 0.5239643 | 0.1656100 | -0.3773758 | -0.2480393 | 0.5429154 | 0.2734423 | 0.4908826 | 0.7853981 | 1.6572752 |
| | 1.1595535 | 0.2199124 | 0.5107253 | 2.1164370 | 2.3361006 | 1.0719175 | 0.9043527 | | | | | |
| 492 | 0.6026683 | 0.6026680 | 0.8645679 | 0.5230281 | 0.1652903 | -0.3782701 | -0.2485793 | 0.5434804 | 0.2737405 | 0.4908826 | 0.7853981 | 1.6551247 |
| | 1.1579676 | 0.2203440 | 0.5102195 | 2.1165094 | 2.3366041 | 1.0709686 | 0.9031562 | | | | | |
| 493 | 0.6018191 | 0.6018188 | 0.8640035 | 0.5220918 | 0.1649706 | -0.3791640 | -0.2491093 | 0.5440596 | 0.2740384 | 0.4908826 | 0.7853981 | 1.6529970 |
| | 1.1563787 | 0.2207759 | 0.5097135 | 2.1165829 | 2.3371086 | 1.0700197 | 0.9019570 | | | | | |
| 494 | 0.6009693 | 0.6009690 | 0.8634388 | 0.5211553 | 0.1646509 | -0.3799569 | -0.2496376 | 0.5446278 | 0.2743363 | 0.4908826 | 0.7853981 | 1.6508789 |
| | 1.1547890 | 0.2212124 | 0.5092066 | 2.1166563 | 2.3376150 | 1.0690694 | 0.9007559 | | | | | |
| 495 | 0.6001206 | 0.6001203 | 0.8628733 | 0.5202198 | 0.1643312 | -0.3808479 | -0.2501629 | 0.5451991 | 0.2746327 | 0.4908826 | 0.7853981 | 1.6487522 |
| | 1.1532011 | 0.2216469 | 0.5086991 | 2.1167297 | 2.3381205 | 1.0681200 | 0.8995566 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 496 | 0.5992704 | 0.5992701 | 0.8623071 | 0.5192819 | 0.1640115 | -0.3817554 | -0.2537437 | 0.5457668 | 0.2749298 | 0.4908826 | 0.7853981 | 1.6466636 |
| | 1.1516113 | 0.2220816 | 0.5081908 | 2.1168032 | 2.3386278 | 1.0671692 | 0.8983582 | | | | | |
| 497 | 0.5984200 | 0.5984197 | 0.8617397 | 0.5183449 | 0.1636918 | -0.3826455 | -0.2515623 | 0.5463373 | 0.2752258 | 0.4908826 | 0.7853981 | 1.6445284 |
| | 1.1500206 | 0.2225166 | 0.5076820 | 2.1160766 | 2.3391342 | 1.0662174 | 0.8971573 | | | | | |
| 498 | 0.5975688 | 0.5975685 | 0.8611714 | 0.5174080 | 0.1633720 | -0.3835248 | -0.2521237 | 0.5468968 | 0.2755213 | 0.4908826 | 0.7853981 | 1.6424570 |
| | 1.1484270 | 0.2229518 | 0.5071727 | 2.1169510 | 2.3396454 | 1.0652657 | 0.8959553 | | | | | |
| 499 | 0.5967187 | 0.5967184 | 0.8606034 | 0.5164708 | 0.1630523 | -0.3844191 | -0.2526965 | 0.5474715 | 0.2758164 | 0.4908826 | 0.7853981 | 1.6403341 |
| | 1.1468372 | 0.2233879 | 0.5066622 | 2.1170254 | 2.3401527 | 1.0643139 | 0.8947549 | | | | | |
| 500 | 0.5958681 | 0.5958678 | 0.8600329 | 0.5155337 | 0.1627326 | -0.3853081 | -0.2532519 | 0.5480407 | 0.2761096 | 0.4908826 | 0.7853981 | 1.6382360 |
| | 1.1452456 | 0.2238236 | 0.5061521 | 2.1170998 | 2.3406610 | 1.0633602 | 0.8935539 | | | | | |
| 501 | 0.5951168 | 0.5951165 | 0.8594614 | 0.5145965 | 0.1624129 | -0.3861939 | -0.2538071 | 0.5486069 | 0.2764024 | 0.4908826 | 0.7853981 | 1.6361523 |
| | 1.1436529 | 0.2242597 | 0.5056413 | 2.1171741 | 2.3411703 | 1.0624065 | 0.8923517 | | | | | |
| 502 | 0.5941657 | 0.5941654 | 0.8588893 | 0.5136590 | 0.1620932 | -0.3870850 | -0.2543756 | 0.5491782 | 0.2766945 | 0.4908826 | 0.7853981 | 1.6340532 |
| | 1.1420603 | 0.2246961 | 0.5051296 | 2.1172475 | 2.3416796 | 1.0614529 | 0.8911501 | | | | | |
| 503 | 0.5933135 | 0.5933132 | 0.8583178 | 0.5127213 | 0.1617735 | -0.3879703 | -0.2549502 | 0.5497438 | 0.2769880 | 0.4908826 | 0.7853981 | 1.6319790 |
| | 1.1404667 | 0.2251344 | 0.5046164 | 2.1173208 | 2.3421917 | 1.0604982 | 0.8899467 | | | | | |
| 504 | 0.5924616 | 0.5924613 | 0.8577461 | 0.5117831 | 0.1614538 | -0.3888532 | -0.2555265 | 0.5503120 | 0.2772810 | 0.4908826 | 0.7853981 | 1.6298990 |
| | 1.1388731 | 0.2255729 | 0.5041025 | 2.1173942 | 2.3427038 | 1.0595446 | 0.8887434 | | | | | |
| 505 | 0.5916092 | 0.5916089 | 0.8571718 | 0.5108454 | 0.1611341 | -0.3897426 | -0.2560902 | 0.5508766 | 0.2775719 | 0.4908826 | 0.7853981 | 1.6278372 |
| | 1.1372786 | 0.2260109 | 0.5035887 | 2.1174755 | 2.3432159 | 1.0585890 | 0.8875402 | | | | | |
| 506 | 0.5907563 | 0.5907560 | 0.8565960 | 0.5099074 | 0.1608143 | -0.3906243 | -0.2566522 | 0.5514387 | 0.2778618 | 0.4908826 | 0.7853981 | 1.6257868 |
| | 1.1356821 | 0.2264491 | 0.5030748 | 2.1175518 | 2.3437300 | 1.0576324 | 0.8863354 | | | | | |
| 507 | 0.5899037 | 0.5899034 | 0.8560200 | 0.5089695 | 0.1604947 | -0.3915133 | -0.2572187 | 0.5520080 | 0.2781513 | 0.4908826 | 0.7853981 | 1.6237144 |
| | 1.1340876 | 0.2268878 | 0.5025600 | 2.1176281 | 2.3442421 | 1.0566750 | 0.8851320 | | | | | |
| 508 | 0.5890497 | 0.5890494 | 0.8554423 | 0.5080312 | 0.1601750 | -0.3923919 | -0.2577785 | 0.5525669 | 0.2784401 | 0.4908826 | 0.7853981 | 1.6216841 |
| | 1.1324892 | 0.2273267 | 0.5020447 | 2.1177044 | 2.3447580 | 1.0557175 | 0.8839281 | | | | | |
| 509 | 0.5881947 | 0.5881944 | 0.8548644 | 0.5070924 | 0.1598552 | -0.3932751 | -0.2583411 | 0.5531304 | 0.2787296 | 0.4908826 | 0.7853981 | 1.6196413 |
| | 1.1308899 | 0.2277663 | 0.5015284 | 2.1177807 | 2.3452740 | 1.0547590 | 0.8827189 | | | | | |
| 510 | 0.5873418 | 0.5873415 | 0.8542866 | 0.5061542 | 0.1595355 | -0.3941560 | -0.2589034 | 0.5537015 | 0.2790176 | 0.4908826 | 0.7853981 | 1.6175737 |
| | 1.1292953 | 0.2282069 | 0.5010111 | 2.1178570 | 2.3457870 | 1.0538015 | 0.8815145 | | | | | |
| 511 | 0.5864867 | 0.5864864 | 0.8537036 | 0.5052152 | 0.1592158 | -0.3950364 | -0.2594653 | 0.5542622 | 0.2793041 | 0.4908826 | 0.7853981 | 1.6155481 |
| | 1.1276951 | 0.2286489 | 0.5004920 | 2.1179342 | 2.3463009 | 1.0528440 | 0.8803073 | | | | | |
| 512 | 0.5856328 | 0.5856325 | 0.8531311 | 0.5042762 | 0.1588961 | -0.3959165 | -0.2600305 | 0.5548246 | 0.2795963 | 0.4908826 | 0.7853981 | 1.6135187 |
| | 1.1260977 | 0.2290909 | 0.4999727 | 2.1180115 | 2.3468246 | 1.0518866 | 0.8791015 | | | | | |
| 513 | 0.5847779 | 0.5847776 | 0.8525514 | 0.5033368 | 0.1585764 | -0.3968107 | -0.2605920 | 0.5553870 | 0.2798842 | 0.4908826 | 0.7853981 | 1.6114941 |
| | 1.1244974 | 0.2295333 | 0.4994528 | 2.1180897 | 2.3473434 | 1.0509272 | 0.8778945 | | | | | |
| 514 | 0.5839233 | 0.5839230 | 0.8519700 | 0.5023977 | 0.1582567 | -0.3976998 | -0.2611577 | 0.5559565 | 0.2801701 | 0.4908826 | 0.7853981 | 1.6094675 |
| | 1.1228991 | 0.2299756 | 0.4989328 | 2.1181669 | 2.3478603 | 1.0499668 | 0.8766879 | | | | | |
| 515 | 0.5830691 | 0.5830688 | 0.8513879 | 0.5014583 | 0.1579370 | -0.3985863 | -0.2617216 | 0.5565233 | 0.2804552 | 0.4908826 | 0.7853981 | 1.6074142 |
| | 1.1213007 | 0.2304183 | 0.4984120 | 2.1182451 | 2.3483782 | 1.0490065 | 0.8754818 | | | | | |
| 516 | 0.5822132 | 0.5822129 | 0.8508065 | 0.5005187 | 0.1576173 | -0.3994648 | -0.2622834 | 0.5570821 | 0.2807424 | 0.4908826 | 0.7853981 | 1.6054134 |
| | 1.1196995 | 0.2308624 | 0.4978906 | 2.1183233 | 2.3488958 | 1.0480471 | 0.8742752 | | | | | |
| 517 | 0.5813569 | 0.5813566 | 0.8502241 | 0.4995789 | 0.1572976 | -0.4003418 | -0.2628418 | 0.5576454 | 0.2810287 | 0.4908826 | 0.7853981 | 1.6034302 |
| | 1.1180983 | 0.2313069 | 0.4973667 | 2.1184015 | 2.3494125 | 1.0470867 | 0.8730683 | | | | | |
| 518 | 0.5805012 | 0.5805009 | 0.8496391 | 0.4986390 | 0.1569778 | -0.4012210 | -0.2634033 | 0.5582088 | 0.2813121 | 0.4908826 | 0.7853981 | 1.6013908 |
| | 1.1164970 | 0.2317509 | 0.4968439 | 2.1184797 | 2.3499292 | 1.0461245 | 0.8718612 | | | | | |
| 519 | 0.5796437 | 0.5796434 | 0.8490556 | 0.4976979 | 0.1566581 | -0.4021056 | -0.2639642 | 0.5587637 | 0.2815983 | 0.4908826 | 0.7853981 | 1.5994139 |
| | 1.1148930 | 0.2321964 | 0.4963192 | 2.1185598 | 2.3504477 | 1.0451641 | 0.8706543 | | | | | |
| 520 | 0.5787881 | 0.5787878 | 0.8484706 | 0.4967567 | 0.1563385 | -0.4029901 | -0.2645213 | 0.5593187 | 0.2818818 | 0.4908826 | 0.7853981 | 1.5974054 |
| | 1.1132917 | 0.2326423 | 0.4957944 | 2.1186380 | 2.3509693 | 1.0442019 | 0.8694473 | | | | | |
| 521 | 0.5779301 | 0.5779298 | 0.8478823 | 0.4958146 | 0.1560187 | -0.4038722 | -0.2650775 | 0.5598709 | 0.2821639 | 0.4908826 | 0.7853981 | 1.5954103 |
| | 1.1116877 | 0.2330872 | 0.4952700 | 2.1187161 | 2.3514926 | 1.0432367 | 0.8682399 | | | | | |
| 522 | 0.5770723 | 0.5770720 | 0.8472939 | 0.4948724 | 0.1556990 | -0.4047511 | -0.2656318 | 0.5604201 | 0.2824466 | 0.4908826 | 0.7853981 | 1.5934296 |
| | 1.1100826 | 0.2335334 | 0.4947439 | 2.1187943 | 2.3520174 | 1.0422735 | 0.8670323 | | | | | |
| 523 | 0.5762138 | 0.5762135 | 0.8467056 | 0.4939277 | 0.1553793 | -0.4056296 | -0.2661845 | 0.5609669 | 0.2827287 | 0.4908826 | 0.7853981 | 1.5914717 |
| | 1.1084757 | 0.2339799 | 0.4942174 | 2.1188724 | 2.3525444 | 1.0413084 | 2.8658225 | | | | | |
| 524 | 0.5753552 | 0.5753549 | 0.8461171 | 0.4929829 | 0.1550596 | -0.4065068 | -0.2667321 | 0.5615024 | 0.2830102 | 0.4908826 | 0.7853981 | 1.5895004 |
| | 1.1068697 | 0.2344270 | 0.4936903 | 2.1189503 | 2.3530734 | 1.0403442 | 0.8646153 | | | | | |
| 525 | 0.5744985 | 0.5744982 | 0.8455287 | 0.4920357 | 0.1547399 | -0.4073835 | -0.2672774 | 0.5621334 | 0.2832915 | 0.4908826 | 0.7853981 | 1.5874891 |
| | 1.1052675 | 0.2348758 | 0.4931608 | 2.1190280 | 2.3536048 | 1.0393801 | 0.8634083 | | | | | |
| 526 | 0.5736401 | 0.5736398 | 0.8449379 | 0.4910884 | 0.1544202 | -0.4082716 | -0.2678202 | 0.5626912 | 0.2835715 | 0.4908826 | 0.7853981 | 1.5855274 |
| | 1.1036615 | 0.2353237 | 0.4926322 | 2.1191056 | 2.3541402 | 1.0384160 | 0.8622013 | | | | | |
| 527 | 0.5727809 | 0.5727806 | 0.8443451 | 0.4901399 | 0.1541005 | -0.4091479 | -0.2683605 | 0.5632484 | 0.2838502 | 0.4908826 | 0.7853981 | 1.5835705 |
| | 1.1020536 | 0.2357717 | 0.4921032 | 2.1191827 | 2.3546705 | 1.0374518 | 0.8609938 | | | | | |
| 528 | 0.5719202 | 0.5719199 | 0.8437520 | 0.4891905 | 0.1537806 | -0.4100238 | -0.2688985 | 0.5638005 | 0.2841305 | 0.4908826 | 0.7853981 | 1.5816355 |
| | 1.1004429 | 0.2362208 | 0.4915727 | 2.1192588 | 2.3552017 | 1.0364869 | 0.8597854 | | | | | |
| 529 | 0.5710606 | 0.5710604 | 0.8431581 | 0.4882410 | 0.1534610 | -0.4108991 | -0.2694359 | 0.5643526 | 0.2844077 | 0.4908826 | 0.7853981 | 1.5796690 |
| | 1.0988359 | 0.2366698 | 0.4910423 | 2.1193348 | 2.3557341 | 1.0355214 | 0.8585764 | | | | | |
| 530 | 0.5702003 | 0.5702000 | 0.8425641 | 0.4872913 | 0.1531413 | -0.4117736 | -0.2699731 | 0.5649189 | 0.2846861 | 0.4908826 | 0.7853981 | 1.5777273 |
| | 1.0972261 | 0.2371199 | 0.4905119 | 2.1194108 | 2.3562676 | 1.0345553 | 0.8573668 | | | | | |
| 531 | 0.5693404 | 0.5693402 | 0.8419696 | 0.4863416 | 0.1528216 | -0.4126469 | -0.2705102 | 0.5654802 | 0.2849638 | 0.4908826 | 0.7853981 | 1.5757704 |
| | 1.0956174 | 0.2375705 | 0.4899777 | 2.1194869 | 2.3568025 | 1.0335887 | 0.8561566 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 532 | 0.5684798 | 0.5684796 | 0.8413737 | 0.4854653 | 0.1525019 | -0.4135317 | -0.2712399 | 0.5660335 | 0.2852409 | 0.4908826 | 0.7853981 | 1.5738440 |
| | 1.0940075 | 0.2380219 | 0.4894440 | 2.1196098 | 2.3573236 | 1.0326080 | 0.8548434 | | | | | |
| 533 | 0.5676191 | 0.5676189 | 0.8407780 | 0.4845235 | 0.1521822 | -0.4144092 | -0.2717558 | 0.5665914 | 0.2855182 | 0.4908826 | 0.7853981 | 1.5719061 |
| | 1.0923967 | 0.2384736 | 0.4889097 | 2.1196918 | 2.3578568 | 1.0316391 | 0.8536681 | | | | | |
| 534 | 0.5667572 | 0.5667570 | 0.8401802 | 0.4835812 | 0.1518625 | -0.4152811 | -0.2723181 | 0.5671436 | 0.2857941 | 0.4908826 | 0.7853981 | 1.5699911 |
| | 1.0907841 | 0.2389255 | 0.4883750 | 2.1197748 | 2.3583908 | 1.0306683 | 0.8524513 | | | | | |
| 535 | 0.5658963 | 0.5658960 | 0.8395802 | 0.4826388 | 0.1515428 | -0.4161594 | -0.2728737 | 0.5677012 | 0.2860675 | 0.4908826 | 0.7853981 | 1.5680609 |
| | 1.0891733 | 0.2393773 | 0.4878401 | 2.1198574 | 2.3589239 | 1.0296974 | 0.8512357 | | | | | |
| 536 | 0.5650339 | 0.5650337 | 0.8389803 | 0.4816964 | 0.1512231 | -0.4170375 | -0.2734302 | 0.5682606 | 0.2863415 | 0.4908826 | 0.7853981 | 1.5661278 |
| | 1.0875607 | 0.2398295 | 0.4873044 | 2.1199417 | 2.3594570 | 1.0287247 | 0.8500183 | | | | | |
| 537 | 0.5641711 | 0.5641709 | 0.8383797 | 0.4807538 | 0.1509033 | -0.4179084 | -0.2739814 | 0.5688117 | 0.2866159 | 0.4908826 | 0.7853981 | 1.5642262 |
| | 1.0859470 | 0.2402827 | 0.4867675 | 2.1200247 | 2.3599899 | 1.0277538 | 0.8488002 | | | | | |
| 538 | 0.5633090 | 0.5633088 | 0.8377774 | 0.4798109 | 0.1505836 | -0.4187869 | -0.2745273 | 0.5693705 | 0.2868881 | 0.4908826 | 0.7853981 | 1.5623026 |
| | 1.0843334 | 0.2407361 | 0.4862303 | 2.1201086 | 2.3605230 | 1.0267801 | 0.8475841 | | | | | |
| 539 | 0.5624465 | 0.5624462 | 0.8371748 | 0.4788679 | 0.1502640 | -0.4196630 | -0.2750699 | 0.5699240 | 0.2871602 | 0.4908826 | 0.7853981 | 1.5603991 |
| | 1.0827198 | 0.2411901 | 0.4856921 | 2.1201935 | 2.3610649 | 1.0258074 | 0.8463653 | | | | | |
| 540 | 0.5615822 | 0.5615821 | 0.8365709 | 0.4779247 | 0.1499442 | -0.4205325 | -0.2756117 | 0.5704768 | 0.2874321 | 0.4908826 | 0.7853981 | 1.5585022 |
| | 1.0811033 | 0.2416444 | 0.4851533 | 2.1202774 | 2.3616028 | 1.0248327 | 0.8451431 | | | | | |
| 541 | 0.5607191 | 0.5607191 | 0.8359689 | 0.4769813 | 0.1496245 | -0.4214075 | -0.2761553 | 0.5710320 | 0.2877051 | 0.4908826 | 0.7853981 | 1.5565996 |
| | 1.0794888 | 0.2421005 | 0.4846124 | 2.1203623 | 2.3621426 | 1.0238609 | 0.8439269 | | | | | |
| 542 | 0.5598550 | 0.5598548 | 0.8353636 | 0.4760375 | 0.1493048 | -0.4222847 | -0.2767007 | 0.5715895 | 0.2879760 | 0.4908826 | 0.7853981 | 1.5546932 |
| | 1.0778725 | 0.2425563 | 0.4840716 | 2.1204472 | 2.3626804 | 1.0228853 | 0.8427068 | | | | | |
| 543 | 0.5589908 | 0.5589905 | 0.8347585 | 0.4750940 | 0.1489851 | -0.4231535 | -0.2772481 | 0.5721386 | 0.2882470 | 0.4908826 | 0.7853981 | 1.5528183 |
| | 1.0762548 | 0.2430126 | 0.4835299 | 2.1205330 | 2.3632221 | 1.0219107 | 0.8414866 | | | | | |
| 544 | 0.5581269 | 0.5581266 | 0.8341519 | 0.4741499 | 0.1486654 | -0.4240298 | -0.2778025 | 0.5726952 | 0.2885157 | 0.4908826 | 0.7853981 | 1.5509214 |
| | 1.0746384 | 0.2434691 | 0.4829879 | 2.1206188 | 2.3637609 | 1.0209341 | 0.8402669 | | | | | |
| 545 | 0.5572627 | 0.5572624 | 0.8335437 | 0.4732059 | 0.1483456 | -0.4249037 | -0.2783547 | 0.5732493 | 0.2887848 | 0.4908826 | 0.7853981 | 1.5490360 |
| | 1.0730209 | 0.2439265 | 0.4824447 | 2.1207047 | 2.3643026 | 1.0199585 | 0.8390470 | | | | | |
| 546 | 0.5563978 | 0.5563976 | 0.8329355 | 0.4722620 | 0.1480260 | -0.4257765 | -0.2789059 | 0.5738025 | 0.2890533 | 0.4908826 | 0.7853981 | 1.5471573 |
| | 1.0714035 | 0.2443839 | 0.4819011 | 2.1207905 | 2.3648443 | 1.0189819 | 0.8378260 | | | | | |
| 547 | 0.5555390 | 0.5555387 | 0.8323268 | 0.4713177 | 0.1477063 | -0.4266486 | -0.2795558 | 0.5743528 | 0.2893222 | 0.4908826 | 0.7853981 | 1.5452919 |
| | 1.0697842 | 0.2448424 | 0.4813562 | 2.1208763 | 2.3653879 | 1.0180059 | 0.8366036 | | | | | |
| 548 | 0.5546863 | 0.5546860 | 0.8317196 | 0.4703780 | 0.1473866 | -0.4275241 | -0.2801043 | 0.5749106 | 0.2895886 | 0.4908826 | 0.7853981 | 1.5434036 |
| | 1.0681648 | 0.2453007 | 0.4808111 | 2.1209631 | 2.3659296 | 1.0170299 | 0.8353810 | | | | | |
| 549 | 0.5537980 | 0.5537980 | 0.8311069 | 0.4694381 | 0.1470668 | -0.4283932 | -0.2806515 | 0.5754500 | 0.2898592 | 0.4908826 | 0.7853981 | 1.5415802 |
| | 1.0665407 | 0.2457611 | 0.4802637 | 2.1210508 | 2.3664739 | 1.0160494 | 0.8341560 | | | | | |
| 550 | 0.5529327 | 0.5529324 | 0.8304962 | 0.4684829 | 0.1467471 | -0.4292575 | -0.2811953 | 0.5760046 | 0.2901261 | 0.4908826 | 0.7853981 | 1.5397109 |
| | 1.0649214 | 0.2462217 | 0.4797158 | 2.1211376 | 2.3670244 | 1.0150709 | 0.8329341 | | | | | |
| 551 | 0.5520669 | 0.5520667 | 0.8298849 | 0.4675376 | 0.1464274 | -0.4301288 | -0.2817330 | 0.5765562 | 0.2903935 | 0.4908826 | 0.7853981 | 1.5378523 |
| | 1.0633002 | 0.2466829 | 0.4791670 | 2.1212254 | 2.3675718 | 1.0140924 | 0.8317105 | | | | | |
| 552 | 0.5511982 | 0.5511980 | 0.8292722 | 0.4665923 | 0.1461077 | -0.4309945 | -0.2822693 | 0.5771022 | 0.2906598 | 0.4908826 | 0.7853981 | 1.5360165 |
| | 1.0616760 | 0.2471441 | 0.4786180 | 2.1213131 | 2.3681202 | 1.0131130 | 0.8304855 | | | | | |
| 553 | 0.5503311 | 0.5503311 | 0.8286595 | 0.4656467 | 0.1457880 | -0.4318677 | -0.2828046 | 0.5776557 | 0.2909261 | 0.4908826 | 0.7853981 | 1.5341587 |
| | 1.0600548 | 0.2476064 | 0.4780675 | 2.1214016 | 2.3686686 | 1.0121336 | 0.8292618 | | | | | |
| 554 | 0.5494626 | 0.5494624 | 0.8280447 | 0.4647012 | 0.1454683 | -0.4327327 | -0.2833389 | 0.5782010 | 0.2911913 | 0.4908826 | 0.7853981 | 1.5323315 |
| | 1.0584287 | 0.2480685 | 0.4775169 | 2.1214905 | 2.3692180 | 1.0111532 | 0.8280354 | | | | | |
| 555 | 0.5485953 | 0.5485951 | 0.8274298 | 0.4637552 | 0.1451486 | -0.4336053 | -0.2838729 | 0.5787538 | 0.2914556 | 0.4908826 | 0.7853981 | 1.5304813 |
| | 1.0568066 | 0.2485317 | 0.4769650 | 2.1215792 | 2.3697681 | 1.0101728 | 0.8268111 | | | | | |
| 556 | 0.5477272 | 0.5477269 | 0.8268119 | 0.4628091 | 0.1448289 | -0.4344747 | -0.2844057 | 0.5793036 | 0.2917178 | 0.4908826 | 0.7853981 | 1.5286455 |
| | 1.0551825 | 0.2489944 | 0.4764132 | 2.1216679 | 2.3703175 | 1.0091896 | 0.8255856 | | | | | |
| 557 | 0.5468574 | 0.5468571 | 0.8261953 | 0.4618627 | 0.1445091 | -0.4353387 | -0.2849370 | 0.5798479 | 0.2919828 | 0.4908826 | 0.7853981 | 1.5268316 |
| | 1.0535556 | 0.2494584 | 0.4758593 | 2.1217575 | 2.3708715 | 1.0082063 | 0.8243577 | | | | | |
| 558 | 0.5459883 | 0.5459880 | 0.8255792 | 0.4609164 | 0.1441895 | -0.4362100 | -0.2854668 | 0.5803995 | 0.2922462 | 0.4908826 | 0.7853981 | 1.5249949 |
| | 1.0519914 | 0.2499241 | 0.4753045 | 2.1218472 | 2.3714237 | 1.0072229 | 0.8231272 | | | | | |
| 559 | 0.5451194 | 0.5451192 | 0.8249597 | 0.4599699 | 0.1438698 | -0.4370733 | -0.2860004 | 0.5809431 | 0.2925080 | 0.4908826 | 0.7853981 | 1.5231886 |
| | 1.0503835 | 0.2503887 | 0.4747499 | 2.1219368 | 2.3719778 | 1.0062398 | 0.8218943 | | | | | |
| 560 | 0.5442484 | 0.5442480 | 0.8243396 | 0.4590232 | 0.1435500 | -0.4379362 | -0.2865326 | 0.5814892 | 0.2927699 | 0.4908826 | 0.7853981 | 1.5213776 |
| | 1.0486746 | 0.2508540 | 0.4741943 | 2.1220274 | 2.3725328 | 1.0052566 | 0.8206583 | | | | | |
| 561 | 0.5433794 | 0.5433792 | 0.8237177 | 0.4580767 | 0.1432303 | -0.4388118 | -0.2870636 | 0.5820421 | 0.2930311 | 0.4908826 | 0.7853981 | 1.5195465 |
| | 1.0470586 | 0.2513205 | 0.4736372 | 2.1221180 | 2.3730869 | 1.0042744 | 0.8194201 | | | | | |
| 562 | 0.5425103 | 0.5425101 | 0.8230978 | 0.4571290 | 0.1429106 | -0.4396741 | -0.2875942 | 0.5825947 | 0.2932916 | 0.4908826 | 0.7853981 | 1.5177517 |
| | 1.0454187 | 0.2517879 | 0.4730796 | 2.1222086 | 2.3736429 | 1.0032892 | 0.8181784 | | | | | |
| 563 | 0.5416414 | 0.5416412 | 0.8224779 | 0.4561819 | 0.1425909 | -0.4405414 | -0.2881244 | 0.5831473 | 0.2935497 | 0.4908826 | 0.7853981 | 1.5159445 |
| | 1.0437849 | 0.2522532 | 0.4725215 | 2.1223001 | 2.3741949 | 1.0023032 | 0.8169330 | | | | | |
| 564 | 0.5407725 | 0.5407722 | 0.8218554 | 0.4552346 | 0.1422712 | -0.4414077 | -0.2886536 | 0.5836988 | 0.2938090 | 0.4908826 | 0.7853981 | 1.5141239 |
| | 1.0421610 | 0.2527204 | 0.4719633 | 2.1223907 | 2.3747559 | 1.0013170 | 0.8156797 | | | | | |
| 565 | 0.5399032 | 0.5399030 | 0.8212332 | 0.4542868 | 0.1419515 | -0.4422765 | -0.2891826 | 0.5842480 | 0.2940667 | 0.4908826 | 0.7853981 | 1.5123367 |
| | 1.0405392 | 0.2531884 | 0.4714035 | 2.1224833 | 2.3753178 | 1.0003270 | 0.8145297 | | | | | |
| 566 | 0.5390338 | 0.5390336 | 0.8206085 | 0.4533391 | 0.1416318 | -0.4431407 | -0.2897102 | 0.5847933 | 0.2943202 | 0.4908826 | 0.7853981 | 1.5120020 |
| | 1.0388722 | 0.2536577 | 0.4708435 | 2.1225763 | 2.3758806 | 0.9993326 | 0.8131755 | | | | | |
| 567 | 0.5381643 | 0.5381641 | 0.8199838 | 0.4523910 | 0.1413121 | -0.4440039 | -0.2902367 | 0.5853319 | 0.2945659 | 0.4908826 | 0.7853981 | 1.5088120 |
| | 1.0372619 | 0.2541271 | 0.4702834 | 2.1226693 | 2.3764391 | 0.9983380 | 0.8118193 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 568 | 0.5371831 | 0.5371829 | 0.8193476 | 0.4514425 | 0.1409923 | -0.4444246 | -0.2907023 | 0.5854169 | 0.2949036 | 0.4908826 | 0.7853981 | 1.5084352 |
| | 1.0354557 | 0.2545871 | 0.4697178 | 2.1227703 | 2.3771601 | 0.9973662 | 0.8107013 | | | | | |
| 569 | 0.5364021 | 0.5364019 | 0.8187210 | 0.4504941 | 0.1406726 | -0.4457176 | -0.2915151 | 0.5863903 | 0.2951001 | 0.4908826 | 0.7853981 | 1.5052519 |
| | 1.0339956 | 0.2550680 | 0.4691535 | 2.1228542 | 2.3775625 | 0.9963784 | 0.8095990 | | | | | |
| 570 | 0.5354359 | 0.5354356 | 0.8180919 | 0.4495454 | 0.1403529 | -0.4461489 | -0.2917859 | 0.5865018 | 0.2954175 | 0.4908826 | 0.7853981 | 1.5048885 |
| | 1.0321875 | 0.2555290 | 0.4685802 | 2.1229572 | 2.3782664 | 0.9953885 | 0.8082353 | | | | | |
| 571 | 0.5345619 | 0.5345616 | 0.8174635 | 0.4485967 | 0.1400332 | -0.4470080 | -0.2923254 | 0.5870413 | 0.2956743 | 0.4908826 | 0.7853981 | 1.5031281 |
| | 1.0305529 | 0.2560019 | 0.4680234 | 2.1230507 | 2.3788519 | 0.9943995 | 0.8070013 | | | | | |
| 572 | 0.5336874 | 0.5336872 | 0.8168332 | 0.4476476 | 0.1397135 | -0.4478669 | -0.2928645 | 0.5875804 | 0.2959296 | 0.4908826 | 0.7853981 | 1.5013723 |
| | 1.0289164 | 0.2564732 | 0.4674570 | 2.1231451 | 2.3794184 | 0.9934090 | 0.8057669 | | | | | |
| 573 | 0.5328130 | 0.5328127 | 0.8162037 | 0.4466982 | 0.1393938 | -0.4487503 | -0.2934063 | 0.5881241 | 0.2961857 | 0.4908826 | 0.7853981 | 1.4996052 |
| | 1.0272809 | 0.2569469 | 0.4668888 | 2.1232395 | 2.3799849 | 0.9924194 | 0.8045327 | | | | | |
| 574 | 0.5319374 | 0.5319371 | 0.8155723 | 0.4457487 | 0.1390741 | -0.4495859 | -0.2939432 | 0.5886600 | 0.2964408 | 0.4908826 | 0.7853981 | 1.4978647 |
| | 1.0256424 | 0.2574207 | 0.4663203 | 2.1233339 | 2.3805542 | 0.9914284 | 0.8032967 | | | | | |
| 575 | 0.5310618 | 0.5310616 | 0.8149400 | 0.4447998 | 0.1387544 | -0.4504486 | -0.2944842 | 0.5892029 | 0.2966952 | 0.4908826 | 0.7853981 | 1.4961052 |
| | 1.0240049 | 0.2578952 | 0.4657506 | 2.1234293 | 2.3811226 | 0.9904367 | 0.8020609 | | | | | |
| 576 | 0.5301864 | 0.5301861 | 0.8143069 | 0.4438490 | 0.1384346 | -0.4513138 | -0.2950268 | 0.5897484 | 0.2969488 | 0.4908826 | 0.7853981 | 1.4943399 |
| | 1.0223675 | 0.2583702 | 0.4651802 | 2.1235247 | 2.3816900 | 0.9894446 | 0.8008251 | | | | | |
| 577 | 0.5293097 | 0.5293095 | 0.8136709 | 0.4428993 | 0.1381149 | -0.4521655 | -0.2955607 | 0.5902804 | 0.2972002 | 0.4908826 | 0.7853981 | 1.4926214 |
| | 1.0207262 | 0.2588445 | 0.4646102 | 2.1236210 | 2.3822613 | 0.9884503 | 0.7995877 | | | | | |
| 578 | 0.5284342 | 0.5284340 | 0.8130364 | 0.4419488 | 0.1377953 | -0.4530321 | -0.2961039 | 0.5908274 | 0.2974527 | 0.4908826 | 0.7853981 | 1.4908571 |
| | 1.0190897 | 0.2593213 | 0.4640375 | 2.1237164 | 2.3828306 | 0.9874573 | 0.7983521 | | | | | |
| 579 | 0.5275579 | 0.5275577 | 0.8124009 | 0.4409983 | 0.1374756 | -0.4538886 | -0.2966406 | 0.5913641 | 0.2977045 | 0.4908826 | 0.7853981 | 1.4891291 |
| | 1.0174484 | 0.2597979 | 0.4634643 | 2.1238136 | 2.3834038 | 0.9864638 | 0.7971151 | | | | | |
| 580 | 0.5266805 | 0.5266802 | 0.8117643 | 0.4400477 | 0.1371558 | -0.4547470 | -0.2971783 | 0.5919028 | 0.2979563 | 0.4908826 | 0.7853981 | 1.4873972 |
| | 1.0158072 | 0.2602752 | 0.4628902 | 2.1239100 | 2.3839769 | 0.9854695 | 0.7958765 | | | | | |
| 581 | 0.5258029 | 0.5258027 | 0.8111270 | 0.4390966 | 0.1368361 | -0.4556047 | -0.2977154 | 0.5924408 | 0.2982076 | 0.4908826 | 0.7853981 | 1.4856701 |
| | 1.0141659 | 0.2607535 | 0.4623148 | 2.1240072 | 2.3845516 | 0.9844748 | 0.7946379 | | | | | |
| 582 | 0.5249249 | 0.5249247 | 0.8104879 | 0.4381456 | 0.1365164 | -0.4564628 | -0.2982528 | 0.5929792 | 0.2984573 | 0.4908826 | 0.7853981 | 1.4839449 |
| | 1.0125237 | 0.2612315 | 0.4617392 | 2.1241045 | 2.3851261 | 0.9834787 | 0.7933987 | | | | | |
| 583 | 0.5240468 | 0.5240466 | 0.8098493 | 0.4371942 | 0.1361967 | -0.4573202 | -0.2987896 | 0.5935169 | 0.2987078 | 0.4908826 | 0.7853981 | 1.4822254 |
| | 1.0108805 | 0.2617112 | 0.4611619 | 2.1242027 | 2.3857021 | 0.9824833 | 0.7921593 | | | | | |
| 584 | 0.5231683 | 0.5231681 | 0.8092085 | 0.4362428 | 0.1358770 | -0.4581743 | -0.2993240 | 0.5940514 | 0.2989563 | 0.4908826 | 0.7853981 | 1.4805174 |
| | 1.0092363 | 0.2621904 | 0.4605844 | 2.1243010 | 2.3862801 | 0.9814863 | 0.7909194 | | | | | |
| 585 | 0.5222897 | 0.5222895 | 0.8085681 | 0.4352912 | 0.1355573 | -0.4590359 | -0.2998633 | 0.5945932 | 0.2992055 | 0.4908826 | 0.7853981 | 1.4787893 |
| | 1.0075941 | 0.2626711 | 0.4600053 | 2.1243992 | 2.3868561 | 0.9804898 | 0.7896793 | | | | | |
| 586 | 0.5214098 | 0.5214096 | 0.8079253 | 0.4343390 | 0.1352376 | -0.4598896 | -0.3003970 | 0.5951272 | 0.2994534 | 0.4908826 | 0.7853981 | 1.4770889 |
| | 1.0059471 | 0.2631519 | 0.4594256 | 2.1244984 | 2.3874359 | 0.9794913 | 0.7884374 | | | | | |
| 587 | 0.5205308 | 0.5205305 | 0.8072838 | 0.4333869 | 0.1349179 | -0.4607456 | -0.3009323 | 0.5956634 | 0.2997019 | 0.4908826 | 0.7853981 | 1.4753838 |
| | 1.0043030 | 0.2636340 | 0.4588442 | 2.1245975 | 2.3880157 | 0.9784942 | 0.7871966 | | | | | |
| 588 | 0.5196507 | 0.5196505 | 0.8066393 | 0.4324346 | 0.1345981 | -0.4616013 | -0.3014670 | 0.5961991 | 0.2999483 | 0.4908826 | 0.7853981 | 1.4736843 |
| | 1.0026560 | 0.2641163 | 0.4582627 | 2.1246967 | 2.3885965 | 0.9774948 | 0.7859545 | | | | | |
| 589 | 0.5187695 | 0.5187693 | 0.8059953 | 0.4314823 | 0.1342784 | -0.4624560 | -0.3020014 | 0.5967345 | 0.3001960 | 0.4908826 | 0.7853981 | 1.4719868 |
| | 1.0010080 | 0.2645993 | 0.4576795 | 2.1247969 | 2.3891772 | 0.9764960 | 0.7847107 | | | | | |
| 590 | 0.5178891 | 0.5178889 | 0.8053504 | 0.4305294 | 0.1339588 | -0.4633082 | -0.3025359 | 0.5972570 | 0.3004423 | 0.4908826 | 0.7853981 | 1.4703026 |
| | 0.9993607 | 0.2650829 | 0.4570956 | 2.1248970 | 2.3897629 | 0.9754966 | 0.7834682 | | | | | |
| 591 | 0.5170084 | 0.5170085 | 0.8047024 | 0.4295765 | 0.1336390 | -0.4641705 | -0.3030726 | 0.5978095 | 0.3006858 | 0.4908826 | 0.7853981 | 1.4685879 |
| | 0.9977142 | 0.2655663 | 0.4565117 | 2.1249971 | 2.3903427 | 0.9744969 | 0.7822257 | | | | | |
| 592 | 0.5161270 | 0.5161268 | 0.8040558 | 0.4286233 | 0.1333193 | -0.4650217 | -0.3036091 | 0.5983410 | 0.3009315 | 0.4908826 | 0.7853981 | 1.4669113 |
| | 0.9960648 | 0.2660512 | 0.4559236 | 2.1250982 | 2.3909242 | 0.9734944 | 0.7809811 | | | | | |
| 593 | 0.5152457 | 0.5152455 | 0.8034080 | 0.4276699 | 0.1329996 | -0.4658750 | -0.3041373 | 0.5988752 | 0.3011758 | 0.4908826 | 0.7853981 | 1.4652290 |
| | 0.9944157 | 0.2665370 | 0.4553387 | 2.1251993 | 2.3915146 | 0.9724932 | 0.7797378 | | | | | |
| 594 | 0.5143634 | 0.5143632 | 0.8027596 | 0.4267160 | 0.1326799 | -0.4667315 | -0.3046717 | 0.5994114 | 0.3014206 | 0.4908826 | 0.7853981 | 1.4635429 |
| | 0.9927654 | 0.2670236 | 0.4547503 | 2.1253014 | 2.3921013 | 0.9714915 | 0.7784922 | | | | | |
| 595 | 0.5134802 | 0.5134799 | 0.8021085 | 0.4257624 | 0.1323602 | -0.4675816 | -0.3052021 | 0.5999418 | 0.3016632 | 0.4908826 | 0.7853981 | 1.4618778 |
| | 0.9911128 | 0.2675095 | 0.4541632 | 2.1254034 | 2.3926897 | 0.9704880 | 0.7772455 | | | | | |
| 596 | 0.5125985 | 0.5125983 | 0.8014572 | 0.4248085 | 0.1320404 | -0.4684352 | -0.3057320 | 0.6004796 | 0.3019046 | 0.4908826 | 0.7853981 | 1.4601917 |
| | 0.9894630 | 0.2679965 | 0.4535724 | 2.1255064 | 2.3932762 | 0.9694844 | 0.7759982 | | | | | |
| 597 | 0.5117143 | 0.5117141 | 0.8008047 | 0.4238545 | 0.1317205 | -0.4692863 | -0.3062614 | 0.6010170 | 0.3021455 | 0.4908826 | 0.7853981 | 1.4585419 |
| | 0.9878086 | 0.2684843 | 0.4529824 | 2.1256094 | 2.3938615 | 0.9684799 | 0.7747533 | | | | | |
| 598 | 0.5108311 | 0.5108309 | 0.8001517 | 0.4229004 | 0.1314011 | -0.4701432 | -0.3067898 | 0.6015543 | 0.3023865 | 0.4908826 | 0.7853981 | 1.4568624 |
| | 0.9861569 | 0.2689729 | 0.4523933 | 2.1257124 | 2.3944469 | 0.9674761 | 0.7735068 | | | | | |
| 599 | 0.5099474 | 0.5099471 | 0.7995078 | 0.4219463 | 0.1310813 | -0.4709972 | -0.3073171 | 0.6020785 | 0.3026260 | 0.4908826 | 0.7853981 | 1.4551954 |
| | 0.9845037 | 0.2694614 | 0.4517942 | 2.1258154 | 2.3950322 | 0.9664719 | 0.7722617 | | | | | |
| 600 | 0.5090618 | 0.5090615 | 0.7988445 | 0.4209922 | 0.1307616 | -0.4718494 | -0.3078426 | 0.6026021 | 0.3028655 | 0.4908826 | 0.7853981 | 1.4535646 |
| | 0.9828463 | 0.2699519 | 0.4511946 | 2.1259203 | 2.3956176 | 0.9654674 | 0.7710164 | | | | | |
| 601 | 0.5081761 | 0.5081758 | 0.7981811 | 0.4200380 | 0.1304419 | -0.4727004 | -0.3083679 | 0.6031258 | 0.3031115 | 0.4908826 | 0.7853981 | 1.4519043 |
| | 0.9811913 | 0.2704431 | 0.4505948 | 2.1260252 | 2.3962029 | 0.9644631 | 0.7697708 | | | | | |
| 602 | 0.5072930 | 0.5072927 | 0.7975174 | 0.4190839 | 0.1301222 | -0.4735513 | -0.3088931 | 0.6036495 | 0.3033507 | 0.4908826 | 0.7853981 | 1.4502506 |
| | 0.9795375 | 0.2709344 | 0.4499948 | 2.1261302 | 2.3967879 | 0.9634589 | 0.7685252 | | | | | |
| 603 | 0.5064067 | 0.5064065 | 0.7968779 | 0.4181297 | 0.1298025 | -0.4744023 | -0.3094182 | 0.6041948 | 0.3035906 | 0.4908826 | 0.7853981 | 1.4486055 |
| | 0.9778799 | 0.2714260 | 0.4493946 | 2.1262351 | 2.3973730 | 0.9624546 | 0.7672796 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 604 | 0.5055209 | 0.5055206 | 0.7962204 | 0.4171678 | 0.1294828 | -0.4752434 | -0.3099759 | 0.6047262 | 0.3038694 | 0.4908826 | 0.7853981 | 1.4469728 |
| | 0.9762218 | 0.2719198 | 0.4488160 | 2.1263399 | 2.3980265 | 0.9614399 | 0.7660127 | | | | | |
| 605 | 0.5046347 | 0.5046344 | 0.7955621 | 0.4162122 | 0.1291631 | -0.4760923 | -0.3105052 | 0.6052554 | 0.3040677 | 0.4908826 | 0.7853981 | 1.4453373 |
| | 0.9745640 | 0.2724132 | 0.4482168 | 2.1264458 | 2.3986244 | 0.9604323 | 0.7647619 | | | | | |
| 606 | 0.5037478 | 0.5037476 | 0.7949013 | 0.4152557 | 0.1288434 | -0.4769438 | -0.3110350 | 0.6057872 | 0.3043042 | 0.4908826 | 0.7853981 | 1.4436960 |
| | 0.9729056 | 0.2729067 | 0.4476169 | 2.1265516 | 2.3992224 | 0.9594225 | 0.7635104 | | | | | |
| 607 | 0.5028606 | 0.5028604 | 0.7942398 | 0.4142995 | 0.1285236 | -0.4777921 | -0.3115627 | 0.6063157 | 0.3045403 | 0.4908826 | 0.7853981 | 1.4420671 |
| | 0.9712452 | 0.2734009 | 0.4470161 | 2.1266584 | 2.3998222 | 0.9584125 | 0.7622582 | | | | | |
| 608 | 0.5019726 | 0.5019724 | 0.7935772 | 0.4133428 | 0.1282039 | -0.4786375 | -0.3120883 | 0.6068414 | 0.3047759 | 0.4908826 | 0.7853981 | 1.4404488 |
| | 0.9695841 | 0.2738956 | 0.4464143 | 2.1267653 | 2.4004240 | 0.9574016 | 0.7610051 | | | | | |
| 609 | 0.5010853 | 0.5010851 | 0.7929144 | 0.4123861 | 0.1278842 | -0.4794905 | -0.3126188 | 0.6073747 | 0.3050110 | 0.4908826 | 0.7853981 | 1.4388103 |
| | 0.9679243 | 0.2743912 | 0.4458112 | 2.1268730 | 2.4010248 | 0.9563909 | 0.7597530 | | | | | |
| 610 | 0.5001969 | 0.5001967 | 0.7922512 | 0.4114290 | 0.1275645 | -0.4803376 | -0.3131453 | 0.6079022 | 0.3052454 | 0.4908826 | 0.7853981 | 1.4371929 |
| | 0.9662623 | 0.2748874 | 0.4452071 | 2.1269804 | 2.4016275 | 0.9553791 | 0.7584993 | | | | | |
| 611 | 0.4993086 | 0.4993083 | 0.7915859 | 0.4104717 | 0.1272448 | -0.4811845 | -0.3136715 | 0.6084293 | 0.3054799 | 0.4908826 | 0.7853981 | 1.4355774 |
| | 0.9645999 | 0.2753847 | 0.4446015 | 2.1270895 | 2.4022322 | 0.9543675 | 0.7572457 | | | | | |
| 612 | 0.4984180 | 0.4984177 | 0.7909184 | 0.4095141 | 0.1269251 | -0.4820260 | -0.3141943 | 0.6089512 | 0.3057127 | 0.4908826 | 0.7853981 | 1.4339819 |
| | 0.9629337 | 0.2758815 | 0.4439958 | 2.1271982 | 2.4028387 | 0.9533531 | 0.7559918 | | | | | |
| 613 | 0.4975288 | 0.4975286 | 0.7902539 | 0.4085560 | 0.1266054 | -0.4828745 | -0.3147210 | 0.6094798 | 0.3059478 | 0.4908826 | 0.7853981 | 1.4323673 |
| | 0.9612709 | 0.2763811 | 0.4433872 | 2.1273069 | 2.4034452 | 0.9523417 | 0.7547343 | | | | | |
| 614 | 0.4966397 | 0.4966395 | 0.7895868 | 0.4075980 | 0.1262857 | -0.4837226 | -0.3152478 | 0.6100085 | 0.3061803 | 0.4908826 | 0.7853981 | 1.4307547 |
| | 0.9596069 | 0.2768806 | 0.4427782 | 2.1274166 | 2.4040527 | 0.9513283 | 0.7534794 | | | | | |
| 615 | 0.4957495 | 0.4957493 | 0.7889172 | 0.4066399 | 0.1259660 | -0.4845709 | -0.3157742 | 0.6105368 | 0.3064111 | 0.4908826 | 0.7853981 | 1.4291458 |
| | 0.9579415 | 0.2773797 | 0.4421691 | 2.1275263 | 2.4046602 | 0.9503130 | 0.7522233 | | | | | |
| 616 | 0.4948603 | 0.4948598 | 0.7882474 | 0.4056817 | 0.1256463 | -0.4854206 | -0.3163015 | 0.6110669 | 0.3066416 | 0.4908826 | 0.7853981 | 1.4275351 |
| | 0.9562774 | 0.2778799 | 0.4415587 | 2.1276369 | 2.4052677 | 0.9492981 | 0.7509683 | | | | | |
| 617 | 0.4939671 | 0.4939668 | 0.7875769 | 0.4047226 | 0.1253266 | -0.4862579 | -0.3168209 | 0.6115844 | 0.3068733 | 0.4908826 | 0.7853981 | 1.4259644 |
| | 0.9546071 | 0.2783810 | 0.4409465 | 2.1277475 | 2.4058819 | 0.9482818 | 0.7497080 | | | | | |
| 618 | 0.4930769 | 0.4930767 | 0.7869069 | 0.4037639 | 0.1250069 | -0.4871045 | -0.3173459 | 0.6121114 | 0.3071038 | 0.4908826 | 0.7853981 | 1.4243660 |
| | 0.9529411 | 0.2788833 | 0.4403332 | 2.1278591 | 2.4064932 | 0.9472670 | 0.7484518 | | | | | |
| 619 | 0.4921845 | 0.4921842 | 0.7862344 | 0.4028046 | 0.1246871 | -0.4879483 | -0.3178690 | 0.6126354 | 0.3073337 | 0.4908826 | 0.7853981 | 1.4227800 |
| | 0.9512722 | 0.2793857 | 0.4397190 | 2.1279707 | 2.4071064 | 0.9462498 | 0.7471925 | | | | | |
| 620 | 0.4912924 | 0.4912922 | 0.7855614 | 0.4018450 | 0.1243674 | -0.4887944 | -0.3183935 | 0.6131619 | 0.3075629 | 0.4908826 | 0.7853981 | 1.4211893 |
| | 0.9496036 | 0.2798892 | 0.4391035 | 2.1280823 | 2.4077196 | 0.9452326 | 0.7459337 | | | | | |
| 621 | 0.4903997 | 0.4903995 | 0.7848867 | 0.4008855 | 0.1240477 | -0.4896352 | -0.3189145 | 0.6136829 | 0.3077909 | 0.4908826 | 0.7853981 | 1.4196177 |
| | 0.9479328 | 0.2803929 | 0.4384874 | 2.1281948 | 2.4083357 | 0.9442141 | 0.7446740 | | | | | |
| 622 | 0.4895069 | 0.4895067 | 0.7842130 | 0.3999256 | 0.1237280 | -0.4904777 | -0.3194355 | 0.6142058 | 0.3080201 | 0.4908826 | 0.7853981 | 1.4180422 |
| | 0.9462627 | 0.2808980 | 0.4378674 | 2.1283083 | 2.4089527 | 0.9431968 | 0.7434142 | | | | | |
| 623 | 0.4886137 | 0.4886135 | 0.7835358 | 0.3989656 | 0.1234083 | -0.4913225 | -0.3199565 | 0.6147308 | 0.3082462 | 0.4908826 | 0.7853981 | 1.4164619 |
| | 0.9445918 | 0.2814027 | 0.4372513 | 2.1284218 | 2.4095688 | 0.9421766 | 0.7421539 | | | | | |
| 624 | 0.4877195 | 0.4877192 | 0.7828588 | 0.3980051 | 0.1230886 | -0.4921646 | -0.3204810 | 0.6152532 | 0.3084734 | 0.4908826 | 0.7853981 | 1.4148932 |
| | 0.9429188 | 0.2819089 | 0.4366213 | 2.1285353 | 2.4101877 | 0.9411568 | 0.7408923 | | | | | |
| 625 | 0.4868246 | 0.4868244 | 0.7821818 | 0.3970442 | 0.1227689 | -0.4930035 | -0.3210003 | 0.6157724 | 0.3087009 | 0.4908826 | 0.7853981 | 1.4133348 |
| | 0.9412446 | 0.2824163 | 0.4360097 | 2.1286497 | 2.4108095 | 0.9401371 | 0.7396298 | | | | | |
| 626 | 0.4859303 | 0.4859301 | 0.7815039 | 0.3960835 | 0.1224492 | -0.4938474 | -0.3215225 | 0.6162965 | 0.3089272 | 0.4908826 | 0.7853981 | 1.4117651 |
| | 0.9395715 | 0.2829240 | 0.4353873 | 2.1287642 | 2.4114304 | 0.9391171 | 0.7383674 | | | | | |
| 627 | 0.4850362 | 0.4850360 | 0.7808246 | 0.3951222 | 0.1221294 | -0.4946910 | -0.3220445 | 0.6168205 | 0.3091524 | 0.4908826 | 0.7853981 | 1.4101982 |
| | 0.9378988 | 0.2834327 | 0.4347636 | 2.1288795 | 2.4120522 | 0.9380959 | 0.7371058 | | | | | |
| 628 | 0.4841403 | 0.4841400 | 0.7801435 | 0.3941608 | 0.1218097 | -0.4955312 | -0.3225663 | 0.6173409 | 0.3093770 | 0.4908826 | 0.7853981 | 1.4086437 |
| | 0.9362223 | 0.2839415 | 0.4341391 | 2.1289949 | 2.4126759 | 0.9370735 | 0.7358417 | | | | | |
| 629 | 0.4832438 | 0.4832436 | 0.7794637 | 0.3931994 | 0.1214901 | -0.4963660 | -0.3230861 | 0.6178560 | 0.3096032 | 0.4908826 | 0.7853981 | 1.4071083 |
| | 0.9345461 | 0.2844518 | 0.4335128 | 2.1291103 | 2.4133024 | 0.9360525 | 0.7345767 | | | | | |
| 630 | 0.4823480 | 0.4823477 | 0.7787805 | 0.3922373 | 0.1211703 | -0.4972110 | -0.3236025 | 0.6183713 | 0.3098259 | 0.4908826 | 0.7853981 | 1.4055443 |
| | 0.9328697 | 0.2849621 | 0.4328860 | 2.1292276 | 2.4139271 | 0.9350286 | 0.7333121 | | | | | |
| 631 | 0.4814508 | 0.4814505 | 0.7780959 | 0.3912752 | 0.1208506 | -0.4980474 | -0.3241172 | 0.6188860 | 0.3100503 | 0.4908826 | 0.7853981 | 1.4040079 |
| | 0.9311908 | 0.2854726 | 0.4322576 | 2.1293443 | 2.4145555 | 0.9340054 | 0.7320467 | | | | | |
| 632 | 0.4805543 | 0.4805540 | 0.7774108 | 0.3903129 | 0.1205309 | -0.4988835 | -0.3246317 | 0.6194004 | 0.3102725 | 0.4908826 | 0.7853981 | 1.4024563 |
| | 0.9295141 | 0.2859858 | 0.4316291 | 2.1294613 | 2.4151831 | 0.9329814 | 0.7307814 | | | | | |
| 633 | 0.4796568 | 0.4796566 | 0.7767302 | 0.3893501 | 0.1202112 | -0.4997254 | -0.3251458 | 0.6199145 | 0.3104961 | 0.4908826 | 0.7853981 | 1.4009266 |
| | 0.9278346 | 0.2864995 | 0.4309965 | 2.1295795 | 2.4158144 | 0.9319574 | 0.7295155 | | | | | |
| 634 | 0.4787594 | 0.4787592 | 0.7760451 | 0.3883872 | 0.1198915 | -0.5005683 | -0.3256701 | 0.6204287 | 0.3107162 | 0.4908826 | 0.7853981 | 1.3993778 |
| | 0.9261562 | 0.2870134 | 0.4303644 | 2.1296978 | 2.4164458 | 0.9309333 | 0.7282493 | | | | | |
| 635 | 0.4778606 | 0.4778604 | 0.7753586 | 0.3874241 | 0.1195718 | -0.5014095 | -0.3261917 | 0.6209428 | 0.3109400 | 0.4908826 | 0.7853981 | 1.3978529 |
| | 0.9244747 | 0.2875279 | 0.4297311 | 2.1298161 | 2.4170771 | 0.9299077 | 0.7269812 | | | | | |
| 636 | 0.4769627 | 0.4769624 | 0.7746706 | 0.3864607 | 0.1192521 | -0.5022494 | -0.3267099 | 0.6214564 | 0.3111600 | 0.4908826 | 0.7853981 | 1.3963184 |
| | 0.9227945 | 0.2880430 | 0.4290969 | 2.1299353 | 2.4177084 | 0.9288812 | 0.7257113 | | | | | |
| 637 | 0.4760630 | 0.4760627 | 0.7739816 | 0.3854969 | 0.1189324 | -0.5030878 | -0.3272247 | 0.6220102 | 0.3113802 | 0.4908826 | 0.7853981 | 1.3948011 |
| | 0.9211116 | 0.2885589 | 0.4284613 | 2.1300554 | 2.4183395 | 0.9278538 | 0.7244399 | | | | | |
| 638 | 0.4751643 | 0.4751641 | 0.7732922 | 0.3845330 | 0.1186126 | -0.5039196 | -0.3277439 | 0.6225322 | 0.3115993 | 0.4908826 | 0.7853981 | 1.3932638 |
| | 0.9194305 | 0.2890754 | 0.4278243 | 2.1301756 | 2.4189707 | 0.9268265 | 0.7231770 | | | | | |
| 639 | 0.4742644 | 0.4742641 | 0.7725913 | 0.3835679 | 0.1182929 | -0.5047559 | -0.3282565 | 0.6230488 | 0.3118181 | 0.4908826 | 0.7853981 | 1.3917456 |
| | 0.9177464 | 0.2895922 | 0.4271864 | 2.1302958 | 2.4196157 | 0.9257979 | 0.7219123 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 640 | 0.4733639 | 0.4733636 | 0.7719096 | 0.3826047 | 0.1179732 | -0.5055916 | -0.3287745 | 0.6235648 | 0.3120363 | 0.4908826 | 0.7853981 | 1.3902321 |
| | 0.9160620 | 0.2901108 | 0.4265472 | 2.1304169 | 2.4202538 | 0.9247692 | 0.7206358 | | | | | |
| 641 | 0.4724634 | 0.4724631 | 0.7712171 | 0.3816400 | 0.1176535 | -0.5064297 | -0.3292910 | 0.6240832 | 0.3122541 | 0.4908826 | 0.7853981 | 1.3887119 |
| | 0.9143773 | 0.2906299 | 0.4259066 | 2.1305389 | 2.4200927 | 0.9237398 | 0.7193663 | | | | | |
| 642 | 0.4715618 | 0.4715616 | 0.7705249 | 0.3806748 | 0.1173338 | -0.5072619 | -0.3298336 | 0.6245958 | 0.3124728 | 0.4908826 | 0.7853981 | 1.3872118 |
| | 0.9126904 | 0.2911503 | 0.4252641 | 2.1306610 | 2.4199359 | 0.9227109 | 0.7180944 | | | | | |
| 643 | 0.4706605 | 0.4706603 | 0.7698316 | 0.3797096 | 0.1170141 | -0.5080966 | -0.3303176 | 0.6251107 | 0.3126904 | 0.4908826 | 0.7853981 | 1.3857069 |
| | 0.9110043 | 0.2916713 | 0.4246204 | 2.1307840 | 2.4197783 | 0.9216813 | 0.7168227 | | | | | |
| 644 | 0.4697588 | 0.4697586 | 0.7691371 | 0.3787442 | 0.1166944 | -0.5089338 | -0.3308331 | 0.6256282 | 0.3129073 | 0.4908826 | 0.7853981 | 1.3841972 |
| | 0.9093171 | 0.2921930 | 0.4239757 | 2.1309071 | 2.4196210 | 0.9206510 | 0.7155505 | | | | | |
| 645 | 0.4688560 | 0.4688558 | 0.7684402 | 0.3777785 | 0.1163747 | -0.5097673 | -0.3313460 | 0.6261420 | 0.3131225 | 0.4908826 | 0.7853981 | 1.3827300 |
| | 0.9076287 | 0.2927148 | 0.4233303 | 2.1310301 | 2.4194637 | 0.9196186 | 0.7142769 | | | | | |
| 646 | 0.4679527 | 0.4679524 | 0.7677422 | 0.3768123 | 0.1160550 | -0.5106013 | -0.3318593 | 0.6266562 | 0.3133373 | 0.4908826 | 0.7853981 | 1.3812037 |
| | 0.9059383 | 0.2932374 | 0.4226835 | 2.1311541 | 2.4193064 | 0.9185855 | 0.7130024 | | | | | |
| 647 | 0.4670506 | 0.4670503 | 0.7670440 | 0.3758463 | 0.1157352 | -0.5114393 | -0.3323747 | 0.6271745 | 0.3135509 | 0.4908826 | 0.7853981 | 1.3796978 |
| | 0.9042511 | 0.2937610 | 0.4220355 | 2.1312790 | 2.4191491 | 0.9175528 | 0.7117298 | | | | | |
| 648 | 0.4661466 | 0.4661463 | 0.7663459 | 0.3748798 | 0.1154156 | -0.5122716 | -0.3328864 | 0.6276872 | 0.3137661 | 0.4908826 | 0.7853981 | 1.3782110 |
| | 0.9025599 | 0.2942856 | 0.4213855 | 2.1314039 | 2.4189918 | 0.9165202 | 0.7104565 | | | | | |
| 649 | 0.4652424 | 0.4652422 | 0.7656464 | 0.3739129 | 0.1150959 | -0.5131015 | -0.3333966 | 0.6281974 | 0.3139801 | 0.4908826 | 0.7853981 | 1.3767319 |
| | 0.9009676 | 0.2948114 | 0.4207343 | 2.1315298 | 2.4188369 | 0.9154866 | 0.7091769 | | | | | |
| 650 | 0.4643373 | 0.4643371 | 0.7649451 | 0.3729458 | 0.1147761 | -0.5139337 | -0.3339081 | 0.6287099 | 0.3141951 | 0.4908826 | 0.7853981 | 1.3752489 |
| | 0.8991748 | 0.2953374 | 0.4200821 | 2.1316557 | 2.4186798 | 0.9144516 | 0.7079018 | | | | | |
| 651 | 0.4634332 | 0.4634331 | 0.7642449 | 0.3719783 | 0.1144564 | -0.5147677 | -0.3344195 | 0.6292241 | 0.3144066 | 0.4908826 | 0.7853981 | 1.3737640 |
| | 0.8974833 | 0.2958653 | 0.4194277 | 2.1317825 | 2.4185227 | 0.9134179 | 0.7066265 | | | | | |
| 652 | 0.4625276 | 0.4625273 | 0.7635425 | 0.3710106 | 0.1141367 | -0.5155998 | -0.3349309 | 0.6297355 | 0.3146192 | 0.4908826 | 0.7853981 | 1.3722678 |
| | 0.8957888 | 0.2963933 | 0.4187725 | 2.1319094 | 2.4183658 | 0.9123825 | 0.7053488 | | | | | |
| 653 | 0.4616224 | 0.4616222 | 0.7628391 | 0.3700428 | 0.1138170 | -0.5164322 | -0.3354427 | 0.6302491 | 0.3148304 | 0.4908826 | 0.7853981 | 1.3708386 |
| | 0.8940957 | 0.2969221 | 0.4181161 | 2.1320372 | 2.4182090 | 0.9113466 | 0.7040723 | | | | | |
| 654 | 0.4607159 | 0.4607155 | 0.7621350 | 0.3690749 | 0.1134973 | -0.5172630 | -0.3359509 | 0.6307573 | 0.3150421 | 0.4908826 | 0.7853981 | 1.3693466 |
| | 0.8923995 | 0.2974515 | 0.4174585 | 2.1321650 | 2.4180523 | 0.9103103 | 0.7027928 | | | | | |
| 655 | 0.4598093 | 0.4598091 | 0.7614292 | 0.3681362 | 0.1131776 | -0.5180926 | -0.3364616 | 0.6312702 | 0.3152521 | 0.4908826 | 0.7853981 | 1.3678732 |
| | 0.8907039 | 0.2979819 | 0.4167994 | 2.1322937 | 2.4178956 | 0.9092726 | 0.7015142 | | | | | |
| 656 | 0.4589021 | 0.4589019 | 0.7607225 | 0.3671376 | 0.1128579 | -0.5189222 | -0.3369707 | 0.6317800 | 0.3154618 | 0.4908826 | 0.7853981 | 1.3664103 |
| | 0.8890064 | 0.2985128 | 0.4161391 | 2.1324234 | 2.4177390 | 0.9082344 | 0.7002345 | | | | | |
| 657 | 0.4579943 | 0.4579940 | 0.7600159 | 0.3661686 | 0.1125382 | -0.5197515 | -0.3374794 | 0.6322897 | 0.3156720 | 0.4908826 | 0.7853981 | 1.3649492 |
| | 0.8873083 | 0.2990451 | 0.4154771 | 2.1325531 | 2.4175825 | 0.9071966 | 0.6989537 | | | | | |
| 658 | 0.4570860 | 0.4570857 | 0.7593073 | 0.3651993 | 0.1122184 | -0.5205778 | -0.3379860 | 0.6327963 | 0.3158808 | 0.4908826 | 0.7853981 | 1.3634996 |
| | 0.8856081 | 0.2995776 | 0.4148142 | 2.1326838 | 2.4174259 | 0.9061570 | 0.6976724 | | | | | |
| 659 | 0.4561779 | 0.4561777 | 0.7585985 | 0.3642299 | 0.1118987 | -0.5214090 | -0.3384955 | 0.6333076 | 0.3160895 | 0.4908826 | 0.7853981 | 1.3620386 |
| | 0.8839102 | 0.3001115 | 0.4141494 | 2.1328144 | 2.4172694 | 0.9051181 | 0.6963910 | | | | | |
| 660 | 0.4552693 | 0.4552690 | 0.7578875 | 0.3632601 | 0.1115790 | -0.5222394 | -0.3390063 | 0.6338184 | 0.3162963 | 0.4908826 | 0.7853981 | 1.3605824 |
| | 0.8822101 | 0.3006457 | 0.4134839 | 2.1329460 | 2.4171128 | 0.9040772 | 0.6951097 | | | | | |
| 661 | 0.4543602 | 0.4543600 | 0.7571759 | 0.3622903 | 0.1112593 | -0.5230669 | -0.3395112 | 0.6343263 | 0.3165029 | 0.4908826 | 0.7853981 | 1.3591347 |
| | 0.8805096 | 0.3011805 | 0.4127971 | 2.1330776 | 2.4169562 | 0.9030360 | 0.6938275 | | | | | |
| 662 | 0.4533821 | 0.4533818 | 0.7564645 | 0.3613200 | 0.1109396 | -0.5239745 | -0.3400221 | 0.6348341 | 0.3167559 | 0.4908826 | 0.7853981 | 1.3586006 |
| | 0.8786795 | 0.3017064 | 0.4121482 | 2.1332097 | 2.4167515 | 0.9019953 | 0.6924477 | | | | | |
| 663 | 0.4525390 | 0.4525388 | 0.7557518 | 0.3603493 | 0.1106199 | -0.5247162 | -0.3405210 | 0.6353361 | 0.3169177 | 0.4908826 | 0.7853981 | 1.3562632 |
| | 0.8771020 | 0.3022539 | 0.4114779 | 2.1333437 | 2.4165969 | 0.9009537 | 0.6912595 | | | | | |
| 664 | 0.4515614 | 0.4515612 | 0.7550371 | 0.3593783 | 0.1103002 | -0.5252308 | -0.3408351 | 0.6355310 | 0.3171674 | 0.4908826 | 0.7853981 | 1.3551100 |
| | 0.8752733 | 0.3027817 | 0.4108005 | 2.1334967 | 2.4164405 | 0.8999105 | 0.6898695 | | | | | |
| 665 | 0.4506496 | 0.4506492 | 0.7543248 | 0.3584069 | 0.1099805 | -0.5260522 | -0.3413387 | 0.6360326 | 0.3173757 | 0.4908826 | 0.7853981 | 1.3542881 |
| | 0.8735673 | 0.3033217 | 0.4101322 | 2.1336212 | 2.4162857 | 0.8988697 | 0.6885741 | | | | | |
| 666 | 0.4497384 | 0.4497381 | 0.7536077 | 0.3574355 | 0.1096607 | -0.5268781 | -0.3418460 | 0.6365389 | 0.3175790 | 0.4908826 | 0.7853981 | 1.3528538 |
| | 0.8718628 | 0.3038607 | 0.4094584 | 2.1337566 | 2.4161309 | 0.8978251 | 0.6872781 | | | | | |
| 667 | 0.4488261 | 0.4488259 | 0.7528912 | 0.3564637 | 0.1093411 | -0.5277035 | -0.3423527 | 0.6370445 | 0.3177834 | 0.4908826 | 0.7853981 | 1.3514242 |
| | 0.8701563 | 0.3044012 | 0.4087825 | 2.1338921 | 2.4159761 | 0.8967811 | 0.6859813 | | | | | |
| 668 | 0.4479132 | 0.4479130 | 0.7521737 | 0.3554916 | 0.1090214 | -0.5285296 | -0.3428601 | 0.6375450 | 0.3179875 | 0.4908826 | 0.7853981 | 1.3500099 |
| | 0.8684480 | 0.3049425 | 0.4081051 | 2.1340275 | 2.4158213 | 0.8957365 | 0.6846835 | | | | | |
| 669 | 0.4470007 | 0.4470005 | 0.7514548 | 0.3545194 | 0.1087018 | -0.5293559 | -0.3433687 | 0.6380525 | 0.3181902 | 0.4908826 | 0.7853981 | 1.3485785 |
| | 0.8667412 | 0.3054846 | 0.4074276 | 2.1341639 | 2.4156666 | 0.8946910 | 0.6833845 | | | | | |
| 670 | 0.4460877 | 0.4460868 | 0.7507355 | 0.3535464 | 0.1083819 | -0.5301822 | -0.3438778 | 0.6385546 | 0.3183933 | 0.4908826 | 0.7853981 | 1.3471642 |
| | 0.8650318 | 0.3060277 | 0.4067463 | 2.1343012 | 2.4155119 | 0.8936453 | 0.6820836 | | | | | |
| 671 | 0.4451733 | 0.4451733 | 0.7500147 | 0.3525738 | 0.1080622 | -0.5310087 | -0.3443872 | 0.6390589 | 0.3185952 | 0.4908826 | 0.7853981 | 1.3457460 |
| | 0.8633222 | 0.3065717 | 0.4060646 | 2.1344395 | 2.4153573 | 0.8925986 | 0.6807808 | | | | | |
| 672 | 0.4442589 | 0.4442589 | 0.7492935 | 0.3516002 | 0.1077425 | -0.5318354 | -0.3448971 | 0.6395628 | 0.3187972 | 0.4908826 | 0.7853981 | 1.3443298 |
| | 0.8616111 | 0.3071170 | 0.4053819 | 2.1345778 | 2.4152028 | 0.8915517 | 0.6794762 | | | | | |
| 673 | 0.4433445 | 0.4433443 | 0.7485722 | 0.3506268 | 0.1074228 | -0.5326635 | -0.3454083 | 0.6400663 | 0.3189991 | 0.4908826 | 0.7853981 | 1.3429174 |
| | 0.8599012 | 0.3076633 | 0.4046994 | 2.1347163 | 2.4150484 | 0.8905053 | 0.6781695 | | | | | |
| 674 | 0.4424302 | 0.4424297 | 0.7478506 | 0.3496529 | 0.1071031 | -0.5334928 | -0.3459203 | 0.6405719 | 0.3192009 | 0.4908826 | 0.7853981 | 1.3415012 |
| | 0.8581902 | 0.3082109 | 0.4040168 | 2.1348553 | 2.4148945 | 0.8894587 | 0.6768609 | | | | | |
| 675 | 0.4415144 | 0.4415142 | 0.7471278 | 0.3486784 | 0.1067834 | -0.5343241 | -0.3464343 | 0.6410695 | 0.3194024 | 0.4908826 | 0.7853981 | 1.3401089 |
| | 0.8564773 | 0.3087592 | 0.4033204 | 2.1349955 | 2.4147401 | 0.8884113 | 0.6757502 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 676 | 0.4405986 | 0.4405984 | 0.7464020 | 0.3477045 | 0.1064637 | -0.5351104 | -0.3458715 | 0.6415740 | 0.3196012 | 0.4908826 | 0.7853981 | 1.3386993 |
| | 0.8547635 | 0.3093073 | 0.4026316 | 2.1351366 | 2.4442577 | 0.8873616 | 0.6744167 | | | | | |
| 677 | 0.4396816 | 0.4396814 | 0.7456737 | 0.3467299 | 0.1061440 | -0.5359321 | -0.3473726 | 0.6420761 | 0.3197984 | 0.4908826 | 0.7853981 | 1.3372993 |
| | 0.8520482 | 0.3094558 | 0.4019418 | 2.1352777 | 2.4449663 | 0.8863098 | 0.6731233 | | | | | |
| 678 | 0.4387647 | 0.4387645 | 0.7449466 | 0.3457548 | 0.1058242 | -0.5367532 | -0.3478730 | 0.6425774 | 0.3199970 | 0.4908826 | 0.7853981 | 1.3359022 |
| | 0.8513328 | 0.3104061 | 0.4012495 | 2.1354198 | 2.4456377 | 0.8852594 | 0.6718301 | | | | | |
| 679 | 0.4378478 | 0.4378470 | 0.7442189 | 0.3447795 | 0.1055045 | -0.5375744 | -0.3483735 | 0.6430789 | 0.3201954 | 0.4908826 | 0.7853981 | 1.3345060 |
| | 0.8496168 | 0.3109576 | 0.4005554 | 2.1355619 | 2.4463318 | 0.8842089 | 0.6705362 | | | | | |
| 680 | 0.4369301 | 0.4369298 | 0.7434877 | 0.3438041 | 0.1051869 | -0.5383963 | -0.3488728 | 0.6435792 | 0.3203921 | 0.4908826 | 0.7853981 | 1.3331165 |
| | 0.8479006 | 0.3115095 | 0.3998604 | 2.1357050 | 2.4470243 | 0.8831572 | 0.6692426 | | | | | |
| 681 | 0.4360114 | 0.4360112 | 0.7427599 | 0.3428281 | 0.1048551 | -0.5392120 | -0.3493708 | 0.6440771 | 0.3205895 | 0.4908826 | 0.7853981 | 1.3317337 |
| | 0.8461817 | 0.3120627 | 0.3991634 | 2.1358490 | 2.4477215 | 0.8821052 | 0.6679491 | | | | | |
| 682 | 0.4350928 | 0.4350926 | 0.7420276 | 0.3418521 | 0.1045454 | -0.5400341 | -0.3498713 | 0.6445795 | 0.3207844 | 0.4908826 | 0.7853981 | 1.3303513 |
| | 0.8444635 | 0.3126160 | 0.3984657 | 2.1359940 | 2.4484177 | 0.8810514 | 0.6666515 | | | | | |
| 683 | 0.4341738 | 0.4341736 | 0.7412944 | 0.3408757 | 0.1042257 | -0.5408534 | -0.3503649 | 0.6450791 | 0.3209790 | 0.4908826 | 0.7853981 | 1.3289585 |
| | 0.8427442 | 0.3131703 | 0.3977664 | 2.1361389 | 2.4491158 | 0.8799971 | 0.6653554 | | | | | |
| 684 | 0.4332539 | 0.4332537 | 0.7405621 | 0.3398989 | 0.1039060 | -0.5416579 | -0.3508667 | 0.6455759 | 0.3211750 | 0.4908826 | 0.7853981 | 1.3275852 |
| | 0.8410231 | 0.3137264 | 0.3970646 | 2.1362848 | 2.4498177 | 0.8789438 | 0.6640581 | | | | | |
| 685 | 0.4323344 | 0.4323341 | 0.7398289 | 0.3389216 | 0.1035863 | -0.5424929 | -0.3513671 | 0.6460792 | 0.3213701 | 0.4908826 | 0.7853981 | 1.3261957 |
| | 0.8393031 | 0.3142838 | 0.3963600 | 2.1364307 | 2.4505186 | 0.8778899 | 0.6627613 | | | | | |
| 686 | 0.4314132 | 0.4314129 | 0.7390938 | 0.3379444 | 0.1032666 | -0.5433086 | -0.3518631 | 0.6465752 | 0.3215644 | 0.4908826 | 0.7853981 | 1.3248281 |
| | 0.8375797 | 0.3148412 | 0.3956565 | 2.1365776 | 2.4512234 | 0.8768347 | 0.6614621 | | | | | |
| 687 | 0.4304920 | 0.4304917 | 0.7383575 | 0.3369668 | 0.1029469 | -0.5441240 | -0.3523588 | 0.6470709 | 0.3217577 | 0.4908826 | 0.7853981 | 1.3234634 |
| | 0.8358561 | 0.3153995 | 0.3949504 | 2.1367254 | 2.4519291 | 0.8757787 | 0.6601630 | | | | | |
| 688 | 0.4295714 | 0.4295712 | 0.7376200 | 0.3359891 | 0.1026272 | -0.5449460 | -0.3528582 | 0.6475731 | 0.3219495 | 0.4908826 | 0.7853981 | 1.3220825 |
| | 0.8341341 | 0.3159586 | 0.3942432 | 2.1368732 | 2.4526339 | 0.8747220 | 0.6588684 | | | | | |
| 689 | 0.4286487 | 0.4286485 | 0.7368804 | 0.3350108 | 0.1023074 | -0.5457681 | -0.3533515 | 0.6480655 | 0.3221409 | 0.4908826 | 0.7853981 | 1.3207302 |
| | 0.8324077 | 0.3165182 | 0.3935345 | 2.1370230 | 2.4533434 | 0.8736637 | 0.6575635 | | | | | |
| 690 | 0.4277258 | 0.4277256 | 0.7361426 | 0.3340329 | 0.1019877 | -0.5465923 | -0.3538460 | 0.6485600 | 0.3223342 | 0.4908826 | 0.7853981 | 1.3193741 |
| | 0.8306811 | 0.3170803 | 0.3928227 | 2.1371727 | 2.4540548 | 0.8726071 | 0.6562622 | | | | | |
| 691 | 0.4268043 | 0.4268038 | 0.7354034 | 0.3330530 | 0.1016680 | -0.5474330 | -0.3543441 | 0.6490610 | 0.3225256 | 0.4908826 | 0.7853981 | 1.3180027 |
| | 0.8289568 | 0.3176432 | 0.3921097 | 2.1373224 | 2.4547653 | 0.8715497 | 0.6549623 | | | | | |
| 692 | 0.4258800 | 0.4258798 | 0.7346617 | 0.3320737 | 0.1013483 | -0.5482862 | -0.3548377 | 0.6495545 | 0.3227161 | 0.4908826 | 0.7853981 | 1.3166523 |
| | 0.8272282 | 0.3182061 | 0.3913957 | 2.1374731 | 2.4554787 | 0.8704903 | 0.6536592 | | | | | |
| 693 | 0.4249560 | 0.4249558 | 0.7339203 | 0.3310944 | 0.1010286 | -0.5490214 | -0.3553323 | 0.6500500 | 0.3229068 | 0.4908826 | 0.7853981 | 1.3152990 |
| | 0.8254998 | 0.3187704 | 0.3906798 | 2.1376247 | 2.4561939 | 0.8694316 | 0.6523564 | | | | | |
| 694 | 0.4240324 | 0.4240322 | 0.7331778 | 0.3301145 | 0.1007089 | -0.5498386 | -0.3558278 | 0.6505475 | 0.3230965 | 0.4908826 | 0.7853981 | 1.3139410 |
| | 0.8237716 | 0.3193359 | 0.3899620 | 2.1377773 | 2.4569101 | 0.8683721 | 0.6510539 | | | | | |
| 695 | 0.4231080 | 0.4231079 | 0.7324333 | 0.3291346 | 0.1003892 | -0.5506532 | -0.3563218 | 0.6510424 | 0.3232848 | 0.4908826 | 0.7853981 | 1.3125925 |
| | 0.8220420 | 0.3199015 | 0.3892433 | 2.1379309 | 2.4576273 | 0.8673111 | 0.6497505 | | | | | |
| 696 | 0.4221829 | 0.4221827 | 0.7316883 | 0.3281541 | 0.1000695 | -0.5514671 | -0.3568153 | 0.6515366 | 0.3234732 | 0.4908826 | 0.7853981 | 1.3112478 |
| | 0.8203113 | 0.3204686 | 0.3885226 | 2.1380844 | 2.4583473 | 0.8662500 | 0.6484460 | | | | | |
| 697 | 0.4212570 | 0.4212564 | 0.7309414 | 0.3271734 | 0.0997497 | -0.5522809 | -0.3573081 | 0.6520306 | 0.3236604 | 0.4908826 | 0.7853981 | 1.3099060 |
| | 0.8185792 | 0.3210363 | 0.3878005 | 2.1382389 | 2.4590683 | 0.8651876 | 0.6471404 | | | | | |
| 698 | 0.4203303 | 0.4203302 | 0.7301933 | 0.3261925 | 0.0994300 | -0.5530949 | -0.3578004 | 0.6525243 | 0.3238471 | 0.4908826 | 0.7853981 | 1.3085651 |
| | 0.8168459 | 0.3216045 | 0.3870770 | 2.1383934 | 2.4597912 | 0.8641243 | 0.6458333 | | | | | |
| 699 | 0.4194035 | 0.4194033 | 0.7294455 | 0.3252113 | 0.0991104 | -0.5539047 | -0.3582916 | 0.6530151 | 0.3240352 | 0.4908826 | 0.7853981 | 1.3072357 |
| | 0.8151115 | 0.3221752 | 0.3863505 | 2.1385498 | 2.4605179 | 0.8630625 | 0.6445268 | | | | | |
| 700 | 0.4184771 | 0.4184769 | 0.7286980 | 0.3242292 | 0.0987906 | -0.5547196 | -0.3587849 | 0.6535103 | 0.3242215 | 0.4908826 | 0.7853981 | 1.3058949 |
| | 0.8133784 | 0.3227465 | 0.3856227 | 2.1387062 | 2.4612496 | 0.8619994 | 0.6432205 | | | | | |
| 701 | 0.4175491 | 0.4175490 | 0.7279484 | 0.3232472 | 0.0984709 | -0.5555317 | -0.3592762 | 0.6540026 | 0.3244078 | 0.4908826 | 0.7853981 | 1.3045635 |
| | 0.8116423 | 0.3233186 | 0.3848534 | 2.1388636 | 2.4619722 | 0.8609357 | 0.6419122 | | | | | |
| 702 | 0.4166210 | 0.4166209 | 0.7271966 | 0.3222649 | 0.0981512 | -0.5563413 | -0.3597661 | 0.6544925 | 0.3245923 | 0.4908826 | 0.7853981 | 1.3032408 |
| | 0.8099059 | 0.3238912 | 0.3841628 | 2.1390219 | 2.4626928 | 0.8598703 | 0.6406035 | | | | | |
| 703 | 0.4156927 | 0.4156925 | 0.7264442 | 0.3212820 | 0.0978315 | -0.5571570 | -0.3602593 | 0.6549885 | 0.3247765 | 0.4908826 | 0.7853981 | 1.3019037 |
| | 0.8081694 | 0.3244652 | 0.3834302 | 2.1391802 | 2.4634123 | 0.8588046 | 0.6392947 | | | | | |
| 704 | 0.4147636 | 0.4147635 | 0.7256911 | 0.3202992 | 0.0975118 | -0.5579656 | -0.3607481 | 0.6554773 | 0.3249605 | 0.4908826 | 0.7853981 | 1.3005867 |
| | 0.8064314 | 0.3250399 | 0.3826963 | 2.1393394 | 2.4641306 | 0.8577389 | 0.6379847 | | | | | |
| 705 | 0.4138338 | 0.4138336 | 0.7249370 | 0.3193157 | 0.0971920 | -0.5587763 | -0.3612381 | 0.6559683 | 0.3251443 | 0.4908826 | 0.7853981 | 1.2992659 |
| | 0.8046917 | 0.3256150 | 0.3819597 | 2.1394997 | 2.4648469 | 0.8566722 | 0.6366735 | | | | | |
| 706 | 0.4129043 | 0.4129041 | 0.7241815 | 0.3183324 | 0.0968724 | -0.5595861 | -0.3617274 | 0.6564585 | 0.3253264 | 0.4908826 | 0.7853981 | 1.2979498 |
| | 0.8029524 | 0.3261923 | 0.3812224 | 2.1396608 | 2.4655582 | 0.8556049 | 0.6353632 | | | | | |
| 707 | 0.4119732 | 0.4119731 | 0.7234248 | 0.3173485 | 0.0965527 | -0.5603961 | -0.3622167 | 0.6569487 | 0.3255086 | 0.4908826 | 0.7853981 | 1.2966337 |
| | 0.8012111 | 0.3267698 | 0.3804832 | 2.1398220 | 2.4662663 | 0.8545367 | 0.6340504 | | | | | |
| 708 | 0.4110424 | 0.4110422 | 0.7226682 | 0.3163642 | 0.0962330 | -0.5612051 | -0.3627051 | 0.6574381 | 0.3256908 | 0.4908826 | 0.7853981 | 1.2953234 |
| | 0.7994694 | 0.3273491 | 0.3797415 | 2.1399851 | 2.4669773 | 0.8534689 | 0.6327341 | | | | | |
| 709 | 0.4101107 | 0.4101105 | 0.7219139 | 0.3153798 | 0.0959132 | -0.5620117 | -0.3631919 | 0.6579250 | 0.3258711 | 0.4908826 | 0.7853981 | 1.2940197 |
| | 0.7977262 | 0.3279282 | 0.3789991 | 2.1401482 | 2.4676883 | 0.8523990 | 0.6314244 | | | | | |
| 710 | 0.4091786 | 0.4091784 | 0.7211596 | 0.3143945 | 0.0955935 | -0.5628206 | -0.3636771 | 0.6584141 | 0.3260528 | 0.4908826 | 0.7853981 | 1.2927122 |
| | 0.7959826 | 0.3285099 | 0.3782544 | 2.1403122 | 2.4683941 | 0.8513302 | 0.6301104 | | | | | |
| 711 | 0.4082468 | 0.4082466 | 0.7203923 | 0.3134094 | 0.0952738 | -0.5636298 | -0.3641686 | 0.6589046 | 0.3262346 | 0.4908826 | 0.7853981 | 1.2914028 |
| | 0.7942396 | 0.3290926 | 0.3775061 | 2.1404762 | 2.4690999 | 0.8502621 | 0.6287957 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 712 | 0.4073144 | 0.4073142 | 0.7196313 | 0.3124238 | 0.0949541 | -0.5644410 | -0.3646573 | 0.6593952 | 0.3264138 | 0.4908826 | 0.7853981 | 1.2900953 |
| | 0.7924951 | 0.3296757 | 0.3767575 | 2.1406422 | 2.4700966 | 0.8491915 | 0.6274822 | | | | | |
| 713 | 0.4063808 | 0.4063808 | 0.7188697 | 0.3114377 | 0.0946344 | -0.5652484 | -0.3651441 | 0.6598828 | 0.3265935 | 0.4908826 | 0.7853981 | 1.2887964 |
| | 0.7907490 | 0.3302601 | 0.3760068 | 2.1408081 | 2.4708462 | 0.8481207 | 0.6261662 | | | | | |
| 714 | 0.4054472 | 0.4054470 | 0.7181059 | 0.3104516 | 0.0943147 | -0.5660530 | -0.3656289 | 0.6603677 | 0.3267714 | 0.4908826 | 0.7853981 | 1.2875071 |
| | 0.7890016 | 0.3308449 | 0.3752550 | 2.1409760 | 2.4715977 | 0.8470485 | 0.6248498 | | | | | |
| 715 | 0.4045124 | 0.4045122 | 0.7173423 | 0.3094651 | 0.0939950 | -0.5669570 | -0.3661132 | 0.6608520 | 0.3269501 | 0.4908826 | 0.7853981 | 1.2862206 |
| | 0.7872528 | 0.3314311 | 0.3745009 | 2.1411438 | 2.4723520 | 0.8459766 | 0.6235320 | | | | | |
| 716 | 0.4035771 | 0.4035769 | 0.7165752 | 0.3084784 | 0.0936753 | -0.5676628 | -0.3665984 | 0.6613381 | 0.3271261 | 0.4908826 | 0.7853981 | 1.2849321 |
| | 0.7855030 | 0.3320171 | 0.3737462 | 2.1413126 | 2.4731054 | 0.8449020 | 0.6221134 | | | | | |
| 717 | 0.4026421 | 0.4026419 | 0.7158075 | 0.3074911 | 0.0933555 | -0.5684711 | -0.3670853 | 0.6618266 | 0.3273014 | 0.4908826 | 0.7853981 | 1.2836370 |
| | 0.7837540 | 0.3326047 | 0.3729891 | 2.1414814 | 2.4738607 | 0.8438271 | 0.6206953 | | | | | |
| 718 | 0.4017062 | 0.4017060 | 0.7150394 | 0.3065037 | 0.0930359 | -0.5692787 | -0.3675710 | 0.6623145 | 0.3274770 | 0.4908826 | 0.7853981 | 1.2823458 |
| | 0.7820029 | 0.3331933 | 0.3722301 | 2.1416521 | 2.4746180 | 0.8427523 | 0.6192760 | | | | | |
| 719 | 0.4007692 | 0.4007691 | 0.7142717 | 0.3055158 | 0.0927162 | -0.5700787 | -0.3680523 | 0.6627949 | 0.3276536 | 0.4908826 | 0.7853981 | 1.2810764 |
| | 0.7802503 | 0.3337838 | 0.3714685 | 2.1418228 | 2.4753909 | 0.8416781 | 0.6182551 | | | | | |
| 720 | 0.3998328 | 0.3998326 | 0.7135026 | 0.3045276 | 0.0923964 | -0.5708833 | -0.3685362 | 0.6632798 | 0.3278289 | 0.4908826 | 0.7853981 | 1.2797966 |
| | 0.7784979 | 0.3343752 | 0.3707052 | 2.1419954 | 2.4761429 | 0.8406029 | 0.6169351 | | | | | |
| 721 | 0.3989950 | 0.3989948 | 0.7127330 | 0.3035389 | 0.0920767 | -0.5716875 | -0.3690197 | 0.6637642 | 0.3280045 | 0.4908826 | 0.7853981 | 1.2785196 |
| | 0.7767437 | 0.3349679 | 0.3699397 | 2.1421680 | 2.4769077 | 0.8395277 | 0.6156132 | | | | | |
| 722 | 0.3979568 | 0.3979566 | 0.7119608 | 0.3025501 | 0.0917570 | -0.5724915 | -0.3695033 | 0.6642485 | 0.3281780 | 0.4908826 | 0.7853981 | 1.2772446 |
| | 0.7749884 | 0.3355609 | 0.3691730 | 2.1423416 | 2.4776735 | 0.8384505 | 0.6142936 | | | | | |
| 723 | 0.3970193 | 0.3970191 | 0.7111878 | 0.3015638 | 0.0914373 | -0.5732971 | -0.3699871 | 0.6647344 | 0.3283505 | 0.4908826 | 0.7853981 | 1.2759666 |
| | 0.7732344 | 0.3361553 | 0.3684043 | 2.1425161 | 2.4784403 | 0.8373728 | 0.6129691 | | | | | |
| 724 | 0.3960803 | 0.3960801 | 0.7104146 | 0.3005713 | 0.0911176 | -0.5741001 | -0.3704694 | 0.6652177 | 0.3285237 | 0.4908826 | 0.7853981 | 1.2746973 |
| | 0.7714782 | 0.3367509 | 0.3676334 | 2.1426907 | 2.4792099 | 0.8362954 | 0.6116456 | | | | | |
| 725 | 0.3951405 | 0.3951403 | 0.7096377 | 0.2995814 | 0.0907979 | -0.5749022 | -0.3709533 | 0.6657001 | 0.3286943 | 0.4908826 | 0.7853981 | 1.2734318 |
| | 0.7697198 | 0.3373463 | 0.3668618 | 2.1428671 | 2.4799805 | 0.8352149 | 0.6103207 | | | | | |
| 726 | 0.3942003 | 0.3942001 | 0.7088621 | 0.2985912 | 0.0904782 | -0.5757021 | -0.3714310 | 0.6661803 | 0.3288664 | 0.4908826 | 0.7853981 | 1.2721739 |
| | 0.7679605 | 0.3379437 | 0.3660873 | 2.1430445 | 2.4807549 | 0.8341360 | 0.6089954 | | | | | |
| 727 | 0.3932602 | 0.3932598 | 0.7080859 | 0.2976007 | 0.0901585 | -0.5765061 | -0.3719134 | 0.6666645 | 0.3290378 | 0.4908826 | 0.7853981 | 1.2709064 |
| | 0.7662019 | 0.3385426 | 0.3653105 | 2.1432219 | 2.4815302 | 0.8330508 | 0.6076702 | | | | | |
| 728 | 0.3923188 | 0.3923186 | 0.7073360 | 0.2966096 | 0.0898387 | -0.5773075 | -0.3723941 | 0.6671462 | 0.3292067 | 0.4908826 | 0.7853981 | 1.2696476 |
| | 0.7644406 | 0.3391416 | 0.3645327 | 2.1433911 | 2.4823055 | 0.8319746 | 0.6063434 | | | | | |
| 729 | 0.3913778 | 0.3913776 | 0.7065591 | 0.2956183 | 0.0895190 | -0.5781061 | -0.3728730 | 0.6676251 | 0.3293794 | 0.4908826 | 0.7853981 | 1.2683973 |
| | 0.7626805 | 0.3397438 | 0.3637510 | 2.1435604 | 2.4830885 | 0.8308966 | 0.6050172 | | | | | |
| 730 | 0.3904353 | 0.3904352 | 0.7057798 | 0.2946264 | 0.0891993 | -0.5789065 | -0.3733527 | 0.6681058 | 0.3295489 | 0.4908826 | 0.7853981 | 1.2671442 |
| | 0.7609168 | 0.3403456 | 0.3629684 | 2.1437616 | 2.4838705 | 0.8298147 | 0.6036888 | | | | | |
| 731 | 0.3894939 | 0.3894938 | 0.7049699 | 0.2936345 | 0.0888796 | -0.5797091 | -0.3738338 | 0.6685868 | 0.3297181 | 0.4908826 | 0.7853981 | 1.2658873 |
| | 0.7591558 | 0.3409493 | 0.3621836 | 2.1439428 | 2.4846525 | 0.8287337 | 0.6023602 | | | | | |
| 732 | 0.3885509 | 0.3885508 | 0.7041881 | 0.2926422 | 0.0885599 | -0.5805085 | -0.3743125 | 0.6690685 | 0.3298867 | 0.4908826 | 0.7853981 | 1.2646389 |
| | 0.7573916 | 0.3415533 | 0.3613971 | 2.1441250 | 2.4854343 | 0.8276513 | 0.6010329 | | | | | |
| 733 | 0.3876073 | 0.3876072 | 0.7034050 | 0.2916495 | 0.0882402 | -0.5813080 | -0.3747913 | 0.6695482 | 0.3300545 | 0.4908826 | 0.7853981 | 1.2633934 |
| | 0.7556264 | 0.3421586 | 0.3606087 | 2.1443081 | 2.4862161 | 0.8265679 | 0.5997030 | | | | | |
| 734 | 0.3866628 | 0.3866627 | 0.7026199 | 0.2906562 | 0.0879205 | -0.5821071 | -0.3752698 | 0.6700276 | 0.3302211 | 0.4908826 | 0.7853981 | 1.2621489 |
| | 0.7538595 | 0.3427647 | 0.3598184 | 2.1444921 | 2.4870157 | 0.8254831 | 0.5983719 | | | | | |
| 735 | 0.3857187 | 0.3857185 | 0.7018353 | 0.2896630 | 0.0876008 | -0.5829056 | -0.3757476 | 0.6705064 | 0.3303880 | 0.4908826 | 0.7853981 | 1.2609081 |
| | 0.7520932 | 0.3433722 | 0.3590260 | 2.1446772 | 2.4878073 | 0.8243994 | 0.5970412 | | | | | |
| 736 | 0.3847731 | 0.3847730 | 0.7010469 | 0.2886693 | 0.0872810 | -0.5837039 | -0.3762252 | 0.6709849 | 0.3305525 | 0.4908826 | 0.7853981 | 1.2596693 |
| | 0.7503242 | 0.3439796 | 0.3582324 | 2.1448631 | 2.4885998 | 0.8233124 | 0.5957066 | | | | | |
| 737 | 0.3838277 | 0.3838275 | 0.7002602 | 0.2876753 | 0.0869613 | -0.5845013 | -0.3767019 | 0.6714626 | 0.3307185 | 0.4908826 | 0.7853981 | 1.2584352 |
| | 0.7485555 | 0.3445895 | 0.3574356 | 2.1450503 | 2.4893931 | 0.8222273 | 0.5943762 | | | | | |
| 738 | 0.3828816 | 0.3828814 | 0.6994711 | 0.2866809 | 0.0866417 | -0.5852990 | -0.3771790 | 0.6719407 | 0.3308827 | 0.4908826 | 0.7853981 | 1.2572002 |
| | 0.7467854 | 0.3451993 | 0.3566375 | 2.1452379 | 2.4901924 | 0.8211434 | 0.5930528 | | | | | |
| 739 | 0.3819344 | 0.3819342 | 0.6986799 | 0.2856861 | 0.0863219 | -0.5860958 | -0.3776551 | 0.6724177 | 0.3310459 | 0.4908826 | 0.7853981 | 1.2559700 |
| | 0.7450135 | 0.3458109 | 0.3558375 | 2.1454268 | 2.4909916 | 0.8200520 | 0.5917303 | | | | | |
| 740 | 0.3809872 | 0.3809871 | 0.6978883 | 0.2846910 | 0.0860022 | -0.5868919 | -0.3781306 | 0.6728941 | 0.3312083 | 0.4908826 | 0.7853981 | 1.2547426 |
| | 0.7432413 | 0.3464230 | 0.3550354 | 2.1456165 | 2.4917927 | 0.8189532 | 0.5904081 | | | | | |
| 741 | 0.3800398 | 0.3800396 | 0.6970963 | 0.2836953 | 0.0856825 | -0.5876857 | -0.3786057 | 0.6733692 | 0.3313743 | 0.4908826 | 0.7853981 | 1.2535229 |
| | 0.7414684 | 0.3470386 | 0.3542242 | 2.1458073 | 2.4925985 | 0.8178479 | 0.5890860 | | | | | |
| 742 | 0.3790922 | 0.3790920 | 0.6963054 | 0.2826995 | 0.0853628 | -0.5884867 | -0.3790791 | 0.6738515 | 0.3315352 | 0.4908826 | 0.7853981 | 1.2522812 |
| | 0.7396963 | 0.3476532 | 0.3534229 | 2.1459990 | 2.4934115 | 0.8167381 | 0.5877624 | | | | | |
| 743 | 0.3780932 | 0.3780931 | 0.6955110 | 0.2817031 | 0.0850431 | -0.5892928 | -0.3795494 | 0.6743459 | 0.3317004 | 0.4908826 | 0.7853981 | 1.2510394 |
| | 0.7378271 | 0.3482593 | 0.3526117 | 2.1461921 | 2.4942366 | 0.8156283 | 0.5864388 | | | | | |
| 744 | 0.3771443 | 0.3771441 | 0.6947165 | 0.2807064 | 0.0847234 | -0.5900875 | -0.3800099 | 0.6748409 | 0.3318639 | 0.4908826 | 0.7853981 | 1.2497906 |
| | 0.7360519 | 0.3488778 | 0.3518016 | 2.1463957 | 2.4950761 | 0.8145116 | 0.5851078 | | | | | |
| 745 | 0.3761947 | 0.3761945 | 0.6939220 | 0.2797095 | 0.0844037 | -0.5908821 | -0.3804599 | 0.6753358 | 0.3320260 | 0.4908826 | 0.7853981 | 1.2485357 |
| | 0.7342754 | 0.3494977 | 0.3509874 | 2.1466032 | 2.4959197 | 0.8133914 | 0.5837717 | | | | | |
| 746 | 0.3752441 | 0.3752440 | 0.6931276 | 0.2787120 | 0.0840840 | -0.5916741 | -0.3809051 | 0.6758301 | 0.3321862 | 0.4908826 | 0.7853981 | 1.2472744 |
| | 0.7324967 | 0.3501169 | 0.3501723 | 2.1468167 | 2.4967691 | 0.8122630 | 0.5824302 | | | | | |
| 747 | 0.3742934 | 0.3742932 | 0.6923332 | 0.2777143 | 0.0837643 | -0.5924652 | -0.3813453 | 0.6763239 | 0.3323446 | 0.4908826 | 0.7853981 | 1.2460069 |
| | 0.7307183 | 0.3507386 | 0.3493570 | 2.1470331 | 2.4976244 | 0.8111264 | 0.5810833 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 748 | 0.3733418 | 0.3733416 | 0.6915313 | 0.2747160 | 0.0834445 | -0.5930091 | -0.3817797 | 0.6764536 | 0.3325372 | 0.4908826 | 0.7853981 | 1.2456207 |
| | 0.7289382 | 0.3513606 | 0.3485339 | 2.1471806 | 2.4983835 | 0.8102478 | 0.5795997 | | | | | |
| 749 | 0.3723907 | 0.3723905 | 0.6907306 | 0.2757175 | 0.0831248 | -0.5938068 | -0.3822548 | 0.6769316 | 0.3326949 | 0.4908826 | 0.7853981 | 1.2444010 |
| | 0.7271585 | 0.3519838 | 0.3477119 | 2.1473799 | 2.4992027 | 0.8091546 | 0.5782596 | | | | | |
| 750 | 0.3714384 | 0.3714382 | 0.6899312 | 0.2747186 | 0.0828052 | -0.5945967 | -0.3827251 | 0.6774019 | 0.3328547 | 0.4908826 | 0.7853981 | 1.2432032 |
| | 0.7253772 | 0.3526090 | 0.3468869 | 2.1475792 | 2.5000277 | 0.8080629 | 0.5769178 | | | | | |
| 751 | 0.3704855 | 0.3704854 | 0.6891297 | 0.2737194 | 0.0824854 | -0.5953914 | -0.3831981 | 0.6778768 | 0.3330131 | 0.4908826 | 0.7853981 | 1.2419949 |
| | 0.7235945 | 0.3532349 | 0.3460601 | 2.1477804 | 2.5008526 | 0.8069697 | 0.5755753 | | | | | |
| 752 | 0.3695323 | 0.3695321 | 0.6883278 | 0.2727198 | 0.0821657 | -0.5961809 | -0.3836679 | 0.6783466 | 0.3331714 | 0.4908826 | 0.7853981 | 1.2408018 |
| | 0.7218110 | 0.3538625 | 0.3452307 | 2.1479826 | 2.5016823 | 0.8058766 | 0.5742322 | | | | | |
| 753 | 0.3685778 | 0.3685777 | 0.6875207 | 0.2717201 | 0.0818460 | -0.5969722 | -0.3841385 | 0.6788182 | 0.3333256 | 0.4908826 | 0.7853981 | 1.2396049 |
| | 0.7200253 | 0.3544890 | 0.3444011 | 2.1481857 | 2.5025110 | 0.8047792 | 0.5728474 | | | | | |
| 754 | 0.3676229 | 0.3676227 | 0.6867151 | 0.2707197 | 0.0815253 | -0.5977537 | -0.3846073 | 0.6792870 | 0.3334816 | 0.4908826 | 0.7853981 | 1.2384157 |
| | 0.7182388 | 0.3551180 | 0.3435682 | 2.1483898 | 2.5033336 | 0.8036833 | 0.5715020 | | | | | |
| 755 | 0.3666674 | 0.3666673 | 0.6859075 | 0.2697192 | 0.0812056 | -0.5985539 | -0.3850789 | 0.6797605 | 0.3336362 | 0.4908826 | 0.7853981 | 1.2372169 |
| | 0.7164513 | 0.3557476 | 0.3427331 | 2.1485949 | 2.5041771 | 0.8025862 | 0.5701454 | | | | | |
| 756 | 0.3657117 | 0.3657116 | 0.6850997 | 0.2687179 | 0.0808858 | -0.5993418 | -0.3855471 | 0.6802287 | 0.3337910 | 0.4908826 | 0.7853981 | 1.2360325 |
| | 0.7146635 | 0.3563792 | 0.3418959 | 2.1488008 | 2.5050144 | 0.8014891 | 0.5686874 | | | | | |
| 757 | 0.3647557 | 0.3647556 | 0.6842927 | 0.2677164 | 0.0805672 | -0.6001338 | -0.3860175 | 0.6807010 | 0.3339467 | 0.4908826 | 0.7853981 | 1.2348394 |
| | 0.7128752 | 0.3570127 | 0.3410545 | 2.1490078 | 2.5058537 | 0.8003938 | 0.5672026 | | | | | |
| 758 | 0.3637988 | 0.3637985 | 0.6834838 | 0.2667146 | 0.0802475 | -0.6009207 | -0.3864847 | 0.6811681 | 0.3341014 | 0.4908826 | 0.7853981 | 1.2336607 |
| | 0.7110849 | 0.3576469 | 0.3402119 | 2.1492167 | 2.5066967 | 0.7992962 | 0.5657164 | | | | | |
| 759 | 0.3628416 | 0.3628414 | 0.6826730 | 0.2657123 | 0.0799277 | -0.6017073 | -0.3869516 | 0.6816350 | 0.3342546 | 0.4908826 | 0.7853981 | 1.2324839 |
| | 0.7092940 | 0.3582821 | 0.3393670 | 2.1494265 | 2.5075407 | 0.7981977 | 0.5642363 | | | | | |
| 760 | 0.3618841 | 0.3618839 | 0.6818613 | 0.2647097 | 0.0796060 | -0.6024982 | -0.3874209 | 0.6821063 | 0.3344073 | 0.4908826 | 0.7853981 | 1.2312975 |
| | 0.7075026 | 0.3589187 | 0.3385199 | 2.1496372 | 2.5083866 | 0.7970989 | 0.5627571 | | | | | |
| 761 | 0.3609260 | 0.3609259 | 0.6810501 | 0.2637066 | 0.0792883 | -0.6032841 | -0.3878870 | 0.6825724 | 0.3345609 | 0.4908826 | 0.7853981 | 1.2301254 |
| | 0.7057108 | 0.3595550 | 0.3376697 | 2.1498489 | 2.5092363 | 0.7960008 | 0.5612814 | | | | | |
| 762 | 0.3599678 | 0.3599676 | 0.6802376 | 0.2627030 | 0.0789686 | -0.6040769 | -0.3883573 | 0.6830455 | 0.3347135 | 0.4908826 | 0.7853981 | 1.2289371 |
| | 0.7039176 | 0.3601964 | 0.3368171 | 2.1500616 | 2.5100861 | 0.7949020 | 0.5598085 | | | | | |
| 763 | 0.3590079 | 0.3590077 | 0.6794227 | 0.2616995 | 0.0786489 | -0.6048613 | -0.3888220 | 0.6835102 | 0.3348649 | 0.4908826 | 0.7853981 | 1.2277708 |
| | 0.7021220 | 0.3608366 | 0.3359632 | 2.1502752 | 2.5109406 | 0.7938015 | 0.5583393 | | | | | |
| 764 | 0.3580483 | 0.3580481 | 0.6786064 | 0.2606954 | 0.0783292 | -0.6056483 | -0.3892884 | 0.6839775 | 0.3350151 | 0.4908826 | 0.7853981 | 1.2265997 |
| | 0.7003259 | 0.3614771 | 0.3351069 | 2.1504909 | 2.5117960 | 0.7927002 | 0.5568731 | | | | | |
| 765 | 0.3570869 | 0.3570867 | 0.6777892 | 0.2596906 | 0.0780095 | -0.6064304 | -0.3897515 | 0.6844396 | 0.3351655 | 0.4908826 | 0.7853981 | 1.2254429 |
| | 0.6985279 | 0.3621203 | 0.3342477 | 2.1507072 | 2.5126553 | 0.7915983 | 0.5554093 | | | | | |
| 766 | 0.3561257 | 0.3561255 | 0.6769706 | 0.2586858 | 0.0776898 | -0.6072165 | -0.3902171 | 0.6849063 | 0.3353147 | 0.4908826 | 0.7853981 | 1.2242765 |
| | 0.6967297 | 0.3627633 | 0.3333866 | 2.1509247 | 2.5135155 | 0.7904956 | 0.5539452 | | | | | |
| 767 | 0.3551642 | 0.3551641 | 0.6761516 | 0.2576805 | 0.0773700 | -0.6080022 | -0.3906821 | 0.6853722 | 0.3354637 | 0.4908826 | 0.7853981 | 1.2231131 |
| | 0.6949308 | 0.3634088 | 0.3325220 | 2.1511440 | 2.5143765 | 0.7893931 | 0.5524811 | | | | | |
| 768 | 0.3542023 | 0.3542021 | 0.6753315 | 0.2566748 | 0.0770503 | -0.6087902 | -0.3911464 | 0.6858405 | 0.3356121 | 0.4908826 | 0.7853981 | 1.2219448 |
| | 0.6931314 | 0.3640552 | 0.3316565 | 2.1513634 | 2.5152435 | 0.7882898 | 0.5510161 | | | | | |
| 769 | 0.3532396 | 0.3532394 | 0.6745112 | 0.2556686 | 0.0767306 | -0.6095750 | -0.3916126 | 0.6863056 | 0.3357610 | 0.4908826 | 0.7853981 | 1.2207861 |
| | 0.6913304 | 0.3647035 | 0.3307871 | 2.1515846 | 2.5161114 | 0.7871869 | 0.5495501 | | | | | |
| 770 | 0.3522763 | 0.3522761 | 0.6736875 | 0.2546623 | 0.0764109 | -0.6103570 | -0.3920749 | 0.6867679 | 0.3359071 | 0.4908826 | 0.7853981 | 1.2196350 |
| | 0.6895290 | 0.3653514 | 0.3299167 | 2.1518078 | 2.5169821 | 0.7860814 | 0.5480835 | | | | | |
| 771 | 0.3513122 | 0.3513120 | 0.6728634 | 0.2536559 | 0.0760912 | -0.6111407 | -0.3925383 | 0.6872320 | 0.3360534 | 0.4908826 | 0.7853981 | 1.2184820 |
| | 0.6877245 | 0.3660309 | 0.3290434 | 2.1520309 | 2.5178537 | 0.7849759 | 0.5466165 | | | | | |
| 772 | 0.3503477 | 0.3503475 | 0.6720377 | 0.2526483 | 0.0757715 | -0.6119243 | -0.3930029 | 0.6876988 | 0.3361987 | 0.4908826 | 0.7853981 | 1.2173223 |
| | 0.6859201 | 0.3666515 | 0.3281679 | 2.1522560 | 2.5187283 | 0.7838693 | 0.5451071 | | | | | |
| 773 | 0.3493825 | 0.3493823 | 0.6712113 | 0.2516406 | 0.0754518 | -0.6127102 | -0.3934652 | 0.6881620 | 0.3363438 | 0.4908826 | 0.7853981 | 1.2161732 |
| | 0.6841143 | 0.3673034 | 0.3272884 | 2.1524820 | 2.5196026 | 0.7827625 | 0.5436477 | | | | | |
| 774 | 0.3484173 | 0.3484171 | 0.6703865 | 0.2506324 | 0.0751321 | -0.6134911 | -0.3939263 | 0.6886231 | 0.3364907 | 0.4908826 | 0.7853981 | 1.2150307 |
| | 0.6823087 | 0.3679585 | 0.3264375 | 2.1527090 | 2.5204778 | 0.7816576 | 0.5421883 | | | | | |
| 775 | 0.3474513 | 0.3474511 | 0.6695532 | 0.2496238 | 0.0748124 | -0.6142735 | -0.3943881 | 0.6890859 | 0.3366356 | 0.4908826 | 0.7853981 | 1.2138853 |
| | 0.6805015 | 0.3686140 | 0.3255232 | 2.1529379 | 2.5213709 | 0.7805510 | 0.5407276 | | | | | |
| 776 | 0.3464847 | 0.3464845 | 0.6687316 | 0.2486153 | 0.0744927 | -0.6150534 | -0.3948483 | 0.6895461 | 0.3367813 | 0.4908826 | 0.7853981 | 1.2127476 |
| | 0.6786932 | 0.3692710 | 0.3246363 | 2.1531677 | 2.5222578 | 0.7794445 | 0.5392666 | | | | | |
| 777 | 0.3455173 | 0.3455171 | 0.6679016 | 0.2476056 | 0.0741730 | -0.6158330 | -0.3953092 | 0.6900079 | 0.3369248 | 0.4908826 | 0.7853981 | 1.2116070 |
| | 0.6769829 | 0.3699285 | 0.3237475 | 2.1533995 | 2.5231457 | 0.7783362 | 0.5378040 | | | | | |
| 778 | 0.3445503 | 0.3445498 | 0.6670699 | 0.2465963 | 0.0738533 | -0.6166140 | -0.3957650 | 0.6904693 | 0.3370667 | 0.4908826 | 0.7853981 | 1.2104692 |
| | 0.6751734 | 0.3705870 | 0.3228565 | 2.1536322 | 2.5240355 | 0.7772269 | 0.5363423 | | | | | |
| 779 | 0.3435813 | 0.3435816 | 0.6662340 | 0.2455859 | 0.0735335 | -0.6173971 | -0.3962300 | 0.6909306 | 0.3372099 | 0.4908826 | 0.7853981 | 1.2093325 |
| | 0.6732620 | 0.3712476 | 0.3219671 | 2.1538658 | 2.5249290 | 0.7761183 | 0.5348785 | | | | | |
| 780 | 0.3426127 | 0.3426126 | 0.6654049 | 0.2445754 | 0.0732138 | -0.6181776 | -0.3966948 | 0.6913914 | 0.3373514 | 0.4908826 | 0.7853981 | 1.2081985 |
| | 0.6714490 | 0.3719088 | 0.3210656 | 2.1541014 | 2.5258245 | 0.7750031 | 0.5334139 | | | | | |
| 781 | 0.3416432 | 0.3416431 | 0.6645693 | 0.2435645 | 0.0728941 | -0.6189578 | -0.3971494 | 0.6918519 | 0.3374918 | 0.4908826 | 0.7853981 | 1.2070665 |
| | 0.6696351 | 0.3725710 | 0.3201669 | 2.1543379 | 2.5267220 | 0.7738865 | 0.5319486 | | | | | |
| 782 | 0.3406731 | 0.3406730 | 0.6637346 | 0.2425535 | 0.0725744 | -0.6197374 | -0.3976038 | 0.6923093 | 0.3376330 | 0.4908826 | 0.7853981 | 1.2059431 |
| | 0.6678205 | 0.3732351 | 0.3192649 | 2.1545753 | 2.5276241 | 0.7727662 | 0.5304826 | | | | | |
| 783 | 0.3397020 | 0.3397018 | 0.6628964 | 0.2415417 | 0.0722547 | -0.6205142 | -0.3980654 | 0.6927689 | 0.3377721 | 0.4908826 | 0.7853981 | 1.2048159 |
| | 0.6660036 | 0.3738497 | 0.3183613 | 2.1548147 | 2.5285273 | 0.7716431 | 0.5290151 | | | | | |

```
784 0.3387312 0.3387310 0.6620584 0.2405296 0.0719350-0.6212952-0.3985248 0.6932302 0.3379112 0.4908826 0.7853981 1.2036858
    0.6641876 0.3745661 0.3174539 2.1550550 2.5294323 0.7705607 0.5304483
785 0.3377596 0.3377594 0.6612199 0.2395170 0.0716153-0.6223738-3.3989827 0.6936890 0.3380504 0.4908826 0.7853981 1.2025623
    0.6623698 0.3752343 0.3165438 2.1552973 2.5303411 0.7694484 0.5294802
786 0.3367870 0.3367869 0.6603805 0.2385042 0.0712956-0.6224496-0.3996383 0.6941451 0.3381896 0.4908826 0.7853981 1.2014475
    0.6605505 0.3759034 0.3156313 2.1555405 2.5312536 0.7683358 0.5281109
787 0.3358135 0.3358133 0.6595371 0.2374910 0.0709758-0.6230271-0.3988956 0.6946029 0.3383256 0.4908826 0.7853981 1.2003298
    0.6587290 0.3765728 0.3147173 2.1557856 2.5321674 0.7672199 0.5267431
788 0.3348407 0.3348405 0.6586940 0.2364772 0.0706561-0.6244069-0.4003938 0.6950630 0.3384616 0.4908826 0.7853981 1.1992073
    0.6569091 0.3772442 0.3137994 2.1560316 2.5330830 0.7661946 0.5253705
789 0.3338658 0.3338656 0.6578492 0.2354633 0.0703365-0.6251789-0.4008771 0.6955153 0.3385974 0.4908826 0.7853981 1.1981049
    0.6550851 0.3779161 0.3128797 2.1562796 2.5340033 0.7649865 0.5239978
790 0.3328917 0.3328915 0.6570066 0.2344486 0.0700167-0.6259574-0.4013643 0.6959742 0.3387350 0.4908826 0.7853981 1.1969881
    0.6532629 0.3785914 0.3119553 2.1565285 2.5349264 0.7638748 0.5226255
791 0.3319162 0.3319160 0.6561610 0.2334337 0.0696970-0.6267314-0.4017183 0.6964284 0.3388708 0.4908826 0.7853981 1.1958838
    0.6514378 0.3792669 0.3110292 2.1567793 2.5358924 0.7627588 0.5212532
792 0.3309401 0.3309399 0.6553138 0.2324182 0.0693773-0.6275009-0.4021730 0.6968842 0.3390056 0.4908826 0.7853981 1.1947765
    0.6496118 0.3799437 0.3101003 2.1570311 2.5367804 0.7616419 0.5198784
793 0.3299636 0.3299634 0.6544647 0.2314023 0.0690576-0.6282797-0.4026252 0.6973373 0.3391389 0.4908826 0.7853981 1.1936779
    0.6477849 0.3806215 0.3091689 2.1572847 2.5377111 0.7605236 0.5185043
794 0.3289869 0.3289867 0.6536161 0.2303860 0.0687379-0.6290591-0.4030833 0.6977970 0.3392729 0.4908826 0.7853981 1.1925631
    0.6459575 0.3813012 0.3082342 2.1575403 2.5386438 0.7594063 0.5171294
795 0.3280094 0.3280092 0.6527663 0.2293696 0.0684182-0.6298291-0.4035343 0.6982473 0.3394065 0.4908826 0.7853981 1.1914730
    0.6441288 0.3819823 0.3072969 2.1577969 2.5395813 0.7582886 0.5157534
796 0.3270305 0.3270304 0.6519132 0.2283524 0.0680985-0.6306052-0.4039887 0.6987036 0.3395379 0.4908826 0.7853981 1.1903696
    0.6422977 0.3826634 0.3063572 2.1580544 2.5405197 0.7571660 0.5143754
797 0.3260519 0.3260517 0.6510623 0.2273349 0.0677788-0.6313741-0.4044389 0.6991528 0.3396715 0.4908826 0.7853981 1.1892643
    0.6404665 0.3833475 0.3054135 2.1583147 2.5414639 0.7560562 0.5129978
798 0.3250731 0.3250729 0.6502096 0.2263168 0.0674590-0.6321499-0.4048830 0.6996089 0.3398036 0.4908826 0.7853981 1.1881838
    0.6386355 0.3840330 0.3044669 2.1585751 2.5424089 0.7549312 0.5116200
799 0.3240928 0.3240926 0.6493554 0.2252985 0.0671393-0.6329202-0.4053437 0.7000595 0.3399352 0.4908826 0.7853981 1.1870975
    0.6368015 0.3847193 0.3035178 2.1588383 2.5433578 0.7538113 0.5102403
800 0.3231124 0.3231122 0.6484994 0.2242797 0.0668196-0.6336949-0.4057968 0.7005146 0.3400654 0.4908826 0.7853981 1.1860018
    0.6349675 0.3854066 0.3025661 2.1591024 2.5443077 0.7526903 0.5088603
801 0.3221320 0.3221319 0.6476429 0.2232604 0.0664999-0.6344668-0.4062480 0.7009667 0.3401953 0.4908826 0.7853981 1.1849146
    0.6331332 0.3860959 0.3016110 2.1593685 2.5452614 0.7515693 0.5074804
802 0.3211504 0.3211502 0.6467843 0.2222409 0.0661802-0.6352435-0.4067001 0.7014207 0.3403240 0.4908826 0.7853981 1.1838236
    0.6312971 0.3867857 0.3006537 2.1596355 2.5462170 0.7504470 0.5060989
803 0.3201680 0.3201678 0.6459250 0.2212209 0.0658605-0.6360095-0.4071494 0.7018700 0.3404528 0.4908826 0.7853981 1.1827450
    0.6294588 0.3874769 0.2996932 2.1599054 2.5471773 0.7493245 0.5047162
804 0.3191854 0.3191853 0.6450676 0.2202002 0.0655408-0.6367779-0.4075981 0.7023187 0.3405835 0.4908826 0.7853981 1.1816692
    0.6276206 0.3881714 0.2987280 2.1601763 2.5481424 0.7482043 0.5033334
805 0.3182021 0.3182019 0.6442064 0.2191792 0.0652211-0.6375504-0.4080489 0.7027715 0.3407114 0.4908826 0.7853981 1.1805849
    0.6257812 0.3888657 0.2977613 2.1604481 2.5491076 0.7470812 0.5019495
806 0.3172181 0.3172179 0.6433455 0.2181576 0.0649014-0.6383225-0.4084983 0.7032219 0.3408401 0.4908826 0.7853981 1.1795073
    0.6239401 0.3895622 0.2967906 2.1607227 2.5500774 0.7459587 0.5005647
807 0.3162340 0.3162338 0.6424848 0.2171357 0.0645816-0.6390880-0.4089462 0.7036697 0.3409691 0.4908826 0.7853981 1.1784372
    0.6220989 0.3902608 0.2958165 2.1609983 2.5510511 0.7448372 0.4991798
808 0.3152136 0.3152134 0.6416211 0.2161134 0.0642620-0.6398675-0.4093955 0.7039495 0.3411196 0.4908826 0.7853981 1.1777697
    0.6201901 0.3909494 0.2948402 2.1612854 2.5523373 0.7437133 0.4977436
809 0.3142623 0.3142622 0.6407558 0.2150907 0.0639423-0.6406232-0.4098469 0.7045654 0.3412226 0.4908826 0.7853981 1.1763000
    0.6184104 0.3916593 0.2938609 2.1615553 2.5530052 0.7425836 0.4964053
810 0.3132417 0.3132415 0.6398886 0.2140675 0.0636225-0.6413225-0.4103002 0.7048451 0.3413712 0.4908826 0.7853981 1.1756334
    0.6165009 0.3923509 0.2928785 2.1618462 2.5540581 0.7414035 0.4949691
811 0.3122539 0.3122537 0.6390211 0.2130438 0.0633028-0.5417885-0.4106364 0.7052913 0.3414960 0.4908826 0.7853981 1.1745710
    0.6146529 0.3930531 0.2918932 2.1621294 2.5550432 0.7403370 0.4935791
812 0.3112664 0.3112662 0.6381549 0.2120197 0.0629831-0.6422755-0.4110818 0.7057366 0.3416225 0.4908826 0.7853981 1.1735115
    0.6128055 0.3937582 0.2909077 2.1624136 2.5560331 0.7392128 0.4921846
813 0.3102791 0.3102789 0.6372871 0.2109951 0.0626634-0.6432542-0.4115298 0.7061866 0.3417476 0.4908826 0.7853981 1.1724434
    0.6109585 0.3944645 0.2899112 2.1626997 2.5570240 0.7380880 0.4907835
814 0.3092896 0.3092895 0.6364143 0.2099704 0.0623437-0.6442075-0.4119744 0.7066312 0.3418700 0.4908826 0.7853981 1.1713877
    0.6091075 0.3951703 0.2889171 2.1629877 2.5580177 0.7369555 0.4893744
815 0.3083005 0.3083003 0.6355437 0.2089450 0.0620240-0.6451936-0.4124189 0.7070776 0.3419935 0.4908826 0.7853981 1.1703291
    0.6072569 0.3958793 0.2879146 2.1632776 2.5590153 0.7358164 0.4879567
816 0.3073102 0.3073100 0.6346695 0.2079191 0.0617043-0.6461814-0.4128650 0.7075230 0.3421149 0.4908826 0.7853981 1.1692724
    0.6054043 0.3965881 0.2869175 2.1635695 2.5600157 0.7346737 0.4865295
817 0.3063198 0.3063196 0.6337959 0.2068932 0.0613846-0.6471630-0.4133129 0.7079675 0.3422371 0.4908826 0.7853981 1.1682224
    0.6035513 0.3972992 0.2859178 2.1638632 2.5610194 0.7335256 0.4850931
818 0.3053284 0.3053282 0.6329211 0.2058660 0.0610648-0.6481384-0.4137619 0.7084106 0.3423590 0.4908826 0.7853981 1.1671753
    0.6016966 0.3980117 0.2849047 2.1641588 2.5620279 0.7323691 0.4836483
819 0.3043364 0.3043362 0.6320443 0.2048388 0.0607451-0.6491105-0.4142120 0.7088556 0.3424792 0.4908826 0.7853981 1.1661243
    0.5998406 0.3987252 0.2838834 2.1644568 2.5630377 0.7312113 0.4822048
```

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 820 | 0.3033445 | 0.3033443 | 0.6311666 | 0.2038112 | 0.0604254 | -0.6488746 | -0.4146396 | 0.7093000 | 0.3425992 | 0.4908826 | 0.7853981 | 1.1650772 |
| | 0.5979848 | 0.3994404 | 0.2828794 | 2.1647558 | 2.5640516 | 0.7301874 | 0.4810445 | | | | | |
| 821 | 0.3023511 | 0.3023509 | 0.6302879 | 0.2027832 | 0.0601057 | -0.6496364 | -0.4150416 | 0.7097422 | 0.3427186 | 0.4908826 | 0.7853981 | 1.1640348 |
| | 0.5961265 | 0.4001566 | 0.2818618 | 2.1650572 | 2.5650692 | 0.7290571 | 0.4796472 | | | | | |
| 822 | 0.3013579 | 0.3013577 | 0.6294036 | 0.2017546 | 0.0597860 | -0.6504000 | -0.4155245 | 0.7101861 | 0.3428390 | 0.4908826 | 0.7853981 | 1.1629896 |
| | 0.5942681 | 0.4008752 | 0.2808402 | 2.1653605 | 2.5660896 | 0.7279276 | 0.4782500 | | | | | |
| 823 | 0.3003635 | 0.3003633 | 0.6285272 | 0.2007756 | 0.0594653 | -0.6511555 | -0.4159684 | 0.7106318 | 0.3429563 | 0.4908826 | 0.7853981 | 1.1619415 |
| | 0.5924078 | 0.4015937 | 0.2798163 | 2.1656656 | 2.5671120 | 0.7267950 | 0.4768513 | | | | | |
| 824 | 0.2993682 | 0.2993680 | 0.6276447 | 0.1996961 | 0.0591456 | -0.6519299 | -0.4164090 | 0.7110724 | 0.3430742 | 0.4908826 | 0.7853981 | 1.1609068 |
| | 0.5905463 | 0.4023142 | 0.2787886 | 2.1659727 | 2.5681400 | 0.7256629 | 0.4754514 | | | | | |
| 825 | 0.2983732 | 0.2983730 | 0.6267616 | 0.1986662 | 0.0588269 | -0.6526906 | -0.4168521 | 0.7115175 | 0.3431914 | 0.4908826 | 0.7853981 | 1.1598625 |
| | 0.5886846 | 0.4030362 | 0.2777575 | 2.1662817 | 2.5691690 | 0.7245309 | 0.4740523 | | | | | |
| 826 | 0.2973765 | 0.2973763 | 0.6258763 | 0.1976358 | 0.0585071 | -0.6534481 | -0.4172709 | 0.7119552 | 0.3433078 | 0.4908826 | 0.7853981 | 1.1586364 |
| | 0.5867199 | 0.4037591 | 0.2767233 | 2.1665926 | 2.5702018 | 0.7233973 | 0.4726500 | | | | | |
| 827 | 0.2963796 | 0.2963794 | 0.6249840 | 0.1966054 | 0.0581875 | -0.6542091 | -0.4177313 | 0.7123966 | 0.3434215 | 0.4908826 | 0.7853981 | 1.1578326 |
| | 0.5847547 | 0.4044821 | 0.2756869 | 2.1669064 | 2.5712395 | 0.7222617 | 0.4711440 | | | | | |
| 828 | 0.2953821 | 0.2953820 | 0.6241020 | 0.1955739 | 0.0578678 | -0.6549663 | -0.4181707 | 0.7128360 | 0.3435380 | 0.4908826 | 0.7853981 | 1.1567745 |
| | 0.5830886 | 0.4052089 | 0.2746459 | 2.1672250 | 2.5722609 | 0.7211288 | 0.4696452 | | | | | |
| 829 | 0.2943841 | 0.2943839 | 0.6232142 | 0.1945621 | 0.0575480 | -0.6557311 | -0.4186119 | 0.7132792 | 0.3436533 | 0.4908826 | 0.7853981 | 1.1557388 |
| | 0.5812217 | 0.4059362 | 0.2736030 | 2.1675386 | 2.5733242 | 0.7199948 | 0.4680416 | | | | | |
| 830 | 0.2933858 | 0.2933856 | 0.6223264 | 0.1935099 | 0.0572283 | -0.6564913 | -0.4190514 | 0.7137196 | 0.3437684 | 0.4908826 | 0.7853981 | 1.1547108 |
| | 0.5793541 | 0.4066657 | 0.2725512 | 2.1678581 | 2.5743723 | 0.7188615 | 0.4670378 | | | | | |
| 831 | 0.2923866 | 0.2923864 | 0.6214346 | 0.1924772 | 0.0569088 | -0.6572511 | -0.4194905 | 0.7141597 | 0.3438813 | 0.4908826 | 0.7853981 | 1.1536846 |
| | 0.5774845 | 0.4073956 | 0.2714998 | 2.1681805 | 2.5754223 | 0.7177251 | 0.4656327 | | | | | |
| 832 | 0.2913868 | 0.2913866 | 0.6205454 | 0.1914439 | 0.0565889 | -0.6580083 | -0.4199280 | 0.7145972 | 0.3439970 | 0.4908826 | 0.7853981 | 1.1526651 |
| | 0.5756142 | 0.4081280 | 0.2704435 | 2.1685038 | 2.5764790 | 0.7165917 | 0.4642268 | | | | | |
| 833 | 0.2903856 | 0.2903854 | 0.6196489 | 0.1904106 | 0.0562692 | -0.6587678 | -0.4203668 | 0.7150369 | 0.3441064 | 0.4908826 | 0.7853981 | 1.1516418 |
| | 0.5737411 | 0.4088588 | 0.2693865 | 2.1688299 | 2.5775347 | 0.7154521 | 0.4628195 | | | | | |
| 834 | 0.2893844 | 0.2893842 | 0.6187550 | 0.1893765 | 0.0559495 | -0.6595259 | -0.4208043 | 0.7154754 | 0.3442187 | 0.4908826 | 0.7853981 | 1.1506224 |
| | 0.5718682 | 0.4095923 | 0.2683292 | 2.1691580 | 2.5785961 | 0.7143157 | 0.4614113 | | | | | |
| 835 | 0.2883828 | 0.2883826 | 0.6178612 | 0.1883420 | 0.0556298 | -0.6602820 | -0.4212437 | 0.7159118 | 0.3443313 | 0.4908826 | 0.7853981 | 1.1496088 |
| | 0.5699942 | 0.4103260 | 0.2672578 | 2.1694889 | 2.5796623 | 0.7131800 | 0.4600030 | | | | | |
| 836 | 0.2873809 | 0.2873799 | 0.6169632 | 0.1873069 | 0.0553101 | -0.6610398 | -0.4216779 | 0.7163499 | 0.3444410 | 0.4908826 | 0.7853981 | 1.1485920 |
| | 0.5681180 | 0.4110652 | 0.2661868 | 2.1698217 | 2.5807304 | 0.7120410 | 0.4585931 | | | | | |
| 837 | 0.2863769 | 0.2863767 | 0.6160652 | 0.1862714 | 0.0549904 | -0.6617973 | -0.4221147 | 0.7167876 | 0.3445510 | 0.4908826 | 0.7853981 | 1.1475773 |
| | 0.5662414 | 0.4118033 | 0.2651157 | 2.1701565 | 2.5818033 | 0.7109026 | 0.4571829 | | | | | |
| 838 | 0.2853728 | 0.2853728 | 0.6151661 | 0.1852356 | 0.0546706 | -0.6625544 | -0.4225512 | 0.7172251 | 0.3446606 | 0.4908826 | 0.7853981 | 1.1465645 |
| | 0.5643635 | 0.4125427 | 0.2640392 | 2.1704931 | 2.5828781 | 0.7097638 | 0.4557713 | | | | | |
| 839 | 0.2843688 | 0.2843687 | 0.6142672 | 0.1841990 | 0.0543509 | -0.6633110 | -0.4229875 | 0.7176619 | 0.3447707 | 0.4908826 | 0.7853981 | 1.1455536 |
| | 0.5624850 | 0.4132842 | 0.2629582 | 2.1708326 | 2.5839586 | 0.7086260 | 0.4543598 | | | | | |
| 840 | 0.2833646 | 0.2833645 | 0.6133685 | 0.1831622 | 0.0540313 | -0.6640647 | -0.4234211 | 0.7180960 | 0.3448812 | 0.4908826 | 0.7853981 | 1.1445513 |
| | 0.5606059 | 0.4140275 | 0.2618733 | 2.1711750 | 2.5850430 | 0.7074891 | 0.4529481 | | | | | |
| 841 | 0.2823583 | 0.2823582 | 0.6124639 | 0.1821249 | 0.0537115 | -0.6648208 | -0.4238565 | 0.7185323 | 0.3449874 | 0.4908826 | 0.7853981 | 1.1435432 |
| | 0.5587234 | 0.4147701 | 0.2607864 | 2.1715193 | 2.5861292 | 0.7063472 | 0.4515330 | | | | | |
| 842 | 0.2813519 | 0.2813515 | 0.6115531 | 0.1810870 | 0.0533918 | -0.6655762 | -0.4242913 | 0.7189680 | 0.3450931 | 0.4908826 | 0.7853981 | 1.1425381 |
| | 0.5568402 | 0.4155142 | 0.2596955 | 2.1718655 | 2.5872192 | 0.7052049 | 0.4501184 | | | | | |
| 843 | 0.2803443 | 0.2803444 | 0.6106537 | 0.1800488 | 0.0530721 | -0.6663313 | -0.4247257 | 0.7194034 | 0.3452004 | 0.4908826 | 0.7853981 | 1.1415348 |
| | 0.5549562 | 0.4162604 | 0.2586042 | 2.1722145 | 2.5883141 | 0.7040646 | 0.4487029 | | | | | |
| 844 | 0.2793372 | 0.2793370 | 0.6097479 | 0.1790099 | 0.0527524 | -0.6670836 | -0.4251583 | 0.7198360 | 0.3453067 | 0.4908826 | 0.7853981 | 1.1405392 |
| | 0.5530713 | 0.4170084 | 0.2575099 | 2.1725664 | 2.5894127 | 0.7029237 | 0.4472870 | | | | | |
| 845 | 0.2783288 | 0.2783287 | 0.6088409 | 0.1779705 | 0.0524327 | -0.6678379 | -0.4255918 | 0.7202705 | 0.3454129 | 0.4908826 | 0.7853981 | 1.1395397 |
| | 0.5511848 | 0.4177576 | 0.2563978 | 2.1729202 | 2.5905151 | 0.7017823 | 0.4458697 | | | | | |
| 846 | 0.2773198 | 0.2773197 | 0.6079330 | 0.1769310 | 0.0521130 | -0.6685938 | -0.4260262 | 0.7207068 | 0.3455157 | 0.4908826 | 0.7853981 | 1.1385374 |
| | 0.5492974 | 0.4185066 | 0.2552924 | 2.1732759 | 2.5916185 | 0.7006434 | 0.4444517 | | | | | |
| 847 | 0.2763101 | 0.2763099 | 0.6070197 | 0.1758907 | 0.0517933 | -0.6693449 | -0.4264626 | 0.7211382 | 0.3456195 | 0.4908826 | 0.7853981 | 1.1375415 |
| | 0.5474082 | 0.4192577 | 0.2541821 | 2.1736355 | 2.5927246 | 0.6994950 | 0.4430325 | | | | | |
| 848 | 0.2752997 | 0.2752996 | 0.6061086 | 0.1748501 | 0.0514736 | -0.6700961 | -0.4268991 | 0.7215717 | 0.3457232 | 0.4908826 | 0.7853981 | 1.1365538 |
| | 0.5455180 | 0.4200109 | 0.2530679 | 2.1739969 | 2.5938425 | 0.6983519 | 0.4416127 | | | | | |
| 849 | 0.2742882 | 0.2742881 | 0.6051934 | 0.1738099 | 0.0511538 | -0.6708508 | -0.4273221 | 0.7220047 | 0.3458239 | 0.4908826 | 0.7853981 | 1.1355619 |
| | 0.5436256 | 0.4207636 | 0.2519507 | 2.1743612 | 2.5949663 | 0.6972056 | 0.4401912 | | | | | |
| 850 | 0.2732764 | 0.2732763 | 0.6042801 | 0.1727672 | 0.0508341 | -0.6716026 | -0.4277535 | 0.7224367 | 0.3459269 | 0.4908826 | 0.7853981 | 1.1345750 |
| | 0.5417330 | 0.4215192 | 0.2508284 | 2.1747274 | 2.5960796 | 0.6960616 | 0.4387695 | | | | | |
| 851 | 0.2722646 | 0.2722645 | 0.6033665 | 0.1717250 | 0.0505144 | -0.6723544 | -0.4281844 | 0.7228668 | 0.3460298 | 0.4908826 | 0.7853981 | 1.1335850 |
| | 0.5398400 | 0.4222766 | 0.2497029 | 2.1750965 | 2.5972052 | 0.6949186 | 0.4373477 | | | | | |
| 852 | 0.2712515 | 0.2712514 | 0.6024496 | 0.1706822 | 0.0501947 | -0.6731060 | -0.4286153 | 0.7232907 | 0.3461304 | 0.4908826 | 0.7853981 | 1.1325989 |
| | 0.5379447 | 0.4230344 | 0.2485721 | 2.1754684 | 2.5983343 | 0.6937729 | 0.4359242 | | | | | |
| 853 | 0.2702385 | 0.2702384 | 0.6015345 | 0.1696392 | 0.0498750 | -0.6738545 | -0.4290441 | 0.7237245 | 0.3462328 | 0.4908826 | 0.7853981 | 1.1316204 |
| | 0.5360494 | 0.4237946 | 0.2474376 | 2.1758432 | 2.5994682 | 0.6926296 | 0.4345133 | | | | | |
| 854 | 0.2692240 | 0.2692239 | 0.6006168 | 0.1685955 | 0.0495553 | -0.6746031 | -0.4294730 | 0.7241584 | 0.3463340 | 0.4908826 | 0.7853981 | 1.1306429 |
| | 0.5341513 | 0.4245557 | 0.2462991 | 2.1762209 | 2.6006059 | 0.6914868 | 0.4330953 | | | | | |
| 855 | 0.2682093 | 0.2682093 | 0.5996962 | 0.1675512 | 0.0492356 | -0.6753553 | -0.4299036 | 0.7245906 | 0.3464329 | 0.4908826 | 0.7853981 | 1.1296577 |
| | 0.5322526 | 0.4253175 | 0.2451572 | 2.1766005 | 2.6017475 | 0.6903379 | 0.4316695 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 856 | 0.2671942 | 0.2671940 | 0.5987770 | 0.1665065 | 0.0484159 | -0.5761073 | -0.4303363 | 0.7250232 | 0.3465329 | 0.4908826 | 0.7853981 | 1.1286745 |
| | 0.5303541 | 0.4263815 | 0.2440106 | 2.1769829 | 2.6028919 | 0.6891930 | 0.4302239 | | | | | |
| 857 | 0.2661778 | 0.2661777 | 0.5978548 | 0.1654614 | 0.0485961 | -0.5768541 | -0.4307611 | 0.7254503 | 0.3466313 | 0.4908826 | 0.7853981 | 1.1277037 |
| | 0.5284525 | 0.4268461 | 0.2438604 | 2.1773691 | 2.6040421 | 0.6883461 | 0.4287761 | | | | | |
| 858 | 0.2651605 | 0.2651604 | 0.5969299 | 0.1644158 | 0.0482764 | -0.5776010 | -0.4311882 | 0.7258774 | 0.3467280 | 0.4908826 | 0.7853981 | 1.1267338 |
| | 0.5265494 | 0.4276113 | 0.2417066 | 2.1777573 | 2.6051960 | 0.6868974 | 0.4273670 | | | | | |
| 859 | 0.2641168 | 0.2641166 | 0.5960034 | 0.1633699 | 0.0479568 | -0.5782203 | -0.4315423 | 0.7261771 | 0.3468409 | 0.4908826 | 0.7853981 | 1.1260538 |
| | 0.5245966 | 0.4283673 | 0.2405492 | 2.1781588 | 2.6064072 | 0.6857479 | 0.4259009 | | | | | |
| 860 | 0.2631236 | 0.2631235 | 0.5950764 | 0.1623233 | 0.0476370 | -0.5790951 | -0.4323421 | 0.7267322 | 0.3469197 | 0.4908826 | 0.7853981 | 1.1247959 |
| | 0.5227388 | 0.4291452 | 0.2393873 | 2.1785431 | 2.6075144 | 0.6845987 | 0.4246059 | | | | | |
| 861 | 0.2620793 | 0.2620792 | 0.5941488 | 0.1612761 | 0.0473173 | -0.5797164 | -0.4329370 | 0.7270337 | 0.3470322 | 0.4908826 | 0.7853981 | 1.1241131 |
| | 0.5207849 | 0.4299047 | 0.2382203 | 2.1789503 | 2.6087341 | 0.6834498 | 0.4233041 | | | | | |
| 862 | 0.2610590 | 0.2610589 | 0.5932189 | 0.1602285 | 0.0469976 | -0.5804612 | -0.4338220 | 0.7274588 | 0.3471266 | 0.4908826 | 0.7853981 | 1.1231518 |
| | 0.5188763 | 0.4306746 | 0.2370499 | 2.1793509 | 2.6099052 | 0.6822993 | 0.4219063 | | | | | |
| 863 | 0.2601378 | 0.2601377 | 0.5922857 | 0.1591805 | 0.0466779 | -0.5812085 | -0.4332487 | 0.7278864 | 0.3472185 | 0.4908826 | 0.7853981 | 1.1221848 |
| | 0.5169657 | 0.4314449 | 0.2358760 | 2.1797543 | 2.6110763 | 0.6811466 | 0.4201720 | | | | | |
| 864 | 0.2590162 | 0.2590160 | 0.5913517 | 0.1581320 | 0.0463582 | -0.5819531 | -0.4338735 | 0.7283112 | 0.3473104 | 0.4908826 | 0.7853981 | 1.1212254 |
| | 0.5150545 | 0.4322167 | 0.2346978 | 2.1801605 | 2.6122561 | 0.6799940 | 0.4187373 | | | | | |
| 865 | 0.2579940 | 0.2579939 | 0.5904160 | 0.1570829 | 0.0460384 | -0.5826988 | -0.4340986 | 0.7287372 | 0.3474008 | 0.4908826 | 0.7853981 | 1.1202641 |
| | 0.5131419 | 0.4329897 | 0.2335153 | 2.1805706 | 2.6134377 | 0.6788403 | 0.4173319 | | | | | |
| 866 | 0.2569718 | 0.2569717 | 0.5894843 | 0.1560333 | 0.0457188 | -0.5834424 | -0.4345225 | 0.7291611 | 0.3474955 | 0.4908826 | 0.7853981 | 1.1193085 |
| | 0.5112296 | 0.4337660 | 0.2323267 | 2.1809826 | 2.6146259 | 0.6776916 | 0.4158065 | | | | | |
| 867 | 0.2559489 | 0.2559488 | 0.5885507 | 0.1549830 | 0.0453991 | -0.5841857 | -0.4349661 | 0.7295848 | 0.3475888 | 0.4908826 | 0.7853981 | 1.1183548 |
| | 0.5093159 | 0.4345436 | 0.2311337 | 2.1813984 | 2.6158190 | 0.6765417 | 0.4144303 | | | | | |
| 868 | 0.2549255 | 0.2549254 | 0.5876157 | 0.1539323 | 0.0450794 | -0.5849349 | -0.4353728 | 0.7300143 | 0.3476812 | 0.4908826 | 0.7853981 | 1.1173887 |
| | 0.5074013 | 0.4353222 | 0.2299365 | 2.1818171 | 2.6170139 | 0.6753913 | 0.4129934 | | | | | |
| 869 | 0.2539012 | 0.2539011 | 0.5866783 | 0.1528811 | 0.0447596 | -0.5856772 | -0.4357954 | 0.7304369 | 0.3477723 | 0.4908826 | 0.7853981 | 1.1164389 |
| | 0.5054850 | 0.4361015 | 0.2287353 | 2.1822386 | 2.6182146 | 0.6742396 | 0.4115552 | | | | | |
| 870 | 0.2528755 | 0.2528754 | 0.5857389 | 0.1518294 | 0.0444399 | -0.5864190 | -0.4362174 | 0.7308589 | 0.3478624 | 0.4908826 | 0.7853981 | 1.1154919 |
| | 0.5035661 | 0.4368815 | 0.2275300 | 2.1826619 | 2.6194201 | 0.6730866 | 0.4101152 | | | | | |
| 871 | 0.2518496 | 0.2518495 | 0.5847985 | 0.1507772 | 0.0441202 | -0.5871632 | -0.4366439 | 0.7312834 | 0.3479519 | 0.4908826 | 0.7853981 | 1.1145391 |
| | 0.5016469 | 0.4376630 | 0.2263200 | 2.1830921 | 2.6206293 | 0.6719316 | 0.4086750 | | | | | |
| 872 | 0.2508236 | 0.2508234 | 0.5838580 | 0.1497245 | 0.0438005 | -0.5879062 | -0.4370633 | 0.7317067 | 0.3480415 | 0.4908826 | 0.7853981 | 1.1135902 |
| | 0.4997272 | 0.4384459 | 0.2251055 | 2.1835241 | 2.6218424 | 0.6707814 | 0.4072347 | | | | | |
| 873 | 0.2497960 | 0.2497959 | 0.5829144 | 0.1486713 | 0.0434808 | -0.5886466 | -0.4374840 | 0.7321274 | 0.3481293 | 0.4908826 | 0.7853981 | 1.1126480 |
| | 0.4978049 | 0.4392294 | 0.2238868 | 2.1839590 | 2.6230612 | 0.6696270 | 0.4057923 | | | | | |
| 874 | 0.2487683 | 0.2487682 | 0.5819703 | 0.1476175 | 0.0431611 | -0.5893893 | -0.4379061 | 0.7325504 | 0.3482170 | 0.4908826 | 0.7853981 | 1.1117020 |
| | 0.4958822 | 0.4400144 | 0.2226632 | 2.1843977 | 2.6242838 | 0.6684731 | 0.4043498 | | | | | |
| 875 | 0.2477392 | 0.2477391 | 0.5810228 | 0.1465634 | 0.0428414 | -0.5901315 | -0.4383275 | 0.7329729 | 0.3483022 | 0.4908826 | 0.7853981 | 1.1107578 |
| | 0.4939569 | 0.4407994 | 0.2214361 | 2.1848402 | 2.6255102 | 0.6673166 | 0.4029055 | | | | | |
| 876 | 0.2467096 | 0.2467095 | 0.5800767 | 0.1455085 | 0.0425217 | -0.5908711 | -0.4387474 | 0.7333927 | 0.3483894 | 0.4908826 | 0.7853981 | 1.1098204 |
| | 0.4920308 | 0.4415869 | 0.2202032 | 2.1852856 | 2.6267433 | 0.6661624 | 0.4014605 | | | | | |
| 877 | 0.2456800 | 0.2456799 | 0.5791314 | 0.1444536 | 0.0422019 | -0.5916124 | -0.4391681 | 0.7338144 | 0.3484777 | 0.4908826 | 0.7853981 | 1.1088800 |
| | 0.4901047 | 0.4423764 | 0.2189646 | 2.1857338 | 2.6279692 | 0.6650059 | 0.4000155 | | | | | |
| 878 | 0.2446491 | 0.2446489 | 0.5781814 | 0.1433973 | 0.0418823 | -0.5923510 | -0.4395871 | 0.7342333 | 0.3485623 | 0.4908826 | 0.7853981 | 1.1079464 |
| | 0.4881759 | 0.4431651 | 0.2177234 | 2.1861868 | 2.6292219 | 0.6638538 | 0.3985689 | | | | | |
| 879 | 0.2436178 | 0.2436177 | 0.5772325 | 0.1423409 | 0.0415626 | -0.5930913 | -0.4400067 | 0.7346539 | 0.3486484 | 0.4908826 | 0.7853981 | 1.1070099 |
| | 0.4862467 | 0.4439564 | 0.2164761 | 2.1866426 | 2.6304684 | 0.6626996 | 0.3971218 | | | | | |
| 880 | 0.2425858 | 0.2425857 | 0.5762806 | 0.1412840 | 0.0412428 | -0.6938316 | -0.4404253 | 0.7350745 | 0.3487323 | 0.4908826 | 0.7853981 | 1.1060743 |
| | 0.4843159 | 0.4447478 | 0.2152249 | 2.1871023 | 2.6317186 | 0.6615434 | 0.3956736 | | | | | |
| 881 | 0.2415525 | 0.2415524 | 0.5753201 | 0.1402265 | 0.0409231 | -0.6945715 | -0.4408435 | 0.7354946 | 0.3488147 | 0.4908826 | 0.7853981 | 1.1051407 |
| | 0.4823827 | 0.4455398 | 0.2139642 | 2.1875668 | 2.6329737 | 0.6603857 | 0.3942240 | | | | | |
| 882 | 0.2405194 | 0.2405193 | 0.5743738 | 0.1391685 | 0.0406034 | -0.6953046 | -0.4412627 | 0.7359123 | 0.3488994 | 0.4908826 | 0.7853981 | 1.1042137 |
| | 0.4804501 | 0.4463344 | 0.2127076 | 2.1880331 | 2.6342344 | 0.6592239 | 0.3927745 | | | | | |
| 883 | 0.2394855 | 0.2394854 | 0.5734203 | 0.1381099 | 0.0402837 | -0.6960370 | -0.4416806 | 0.7363307 | 0.3489830 | 0.4908826 | 0.7853981 | 1.1032848 |
| | 0.4785158 | 0.4471294 | 0.2114413 | 2.1884992 | 2.6355000 | 0.6580757 | 0.3913249 | | | | | |
| 884 | 0.2384507 | 0.2384506 | 0.5724642 | 0.1370508 | 0.0399640 | -0.6967660 | -0.4420983 | 0.7367454 | 0.3490657 | 0.4908826 | 0.7853981 | 1.1023560 |
| | 0.4765798 | 0.4479260 | 0.2101703 | 2.1889791 | 2.6367702 | 0.6569195 | 0.3898724 | | | | | |
| 885 | 0.2374148 | 0.2374147 | 0.5715063 | 0.1359915 | 0.0396443 | -0.6974918 | -0.4425147 | 0.7371659 | 0.3491471 | 0.4908826 | 0.7853981 | 1.1014347 |
| | 0.4746418 | 0.4487224 | 0.2088951 | 2.1894679 | 2.6380353 | 0.6557621 | 0.3884194 | | | | | |
| 886 | 0.2363791 | 0.2363790 | 0.5705487 | 0.1349313 | 0.0393246 | -0.6982161 | -0.4429317 | 0.7375836 | 0.3492291 | 0.4908826 | 0.7853981 | 1.1005106 |
| | 0.4727041 | 0.4495203 | 0.2076142 | 2.1899605 | 2.6393291 | 0.6546060 | 0.3869665 | | | | | |
| 887 | 0.2353423 | 0.2353421 | 0.5695893 | 0.1338705 | 0.0390039 | -0.6989387 | -0.4433477 | 0.7380036 | 0.3493100 | 0.4908826 | 0.7853981 | 1.0995827 |
| | 0.4707645 | 0.4503202 | 0.2063294 | 2.1904568 | 2.6405804 | 0.6534491 | 0.3855124 | | | | | |
| 888 | 0.2343044 | 0.2343043 | 0.5686249 | 0.1328083 | 0.0386851 | -0.6996614 | -0.4437647 | 0.7384186 | 0.3493901 | 0.4908826 | 0.7853981 | 1.0986662 |
| | 0.4688228 | 0.4511200 | 0.2050348 | 2.1909579 | 2.6418330 | 0.6522912 | 0.3840584 | | | | | |
| 889 | 0.2332659 | 0.2332658 | 0.5676638 | 0.1317477 | 0.0383659 | -0.7003842 | -0.4441818 | 0.7388376 | 0.3494679 | 0.4908826 | 0.7853981 | 1.0977421 |
| | 0.4668831 | 0.4519203 | 0.2037433 | 2.1914623 | 2.6430857 | 0.6511317 | 0.3826035 | | | | | |
| 890 | 0.2322267 | 0.2322266 | 0.5666993 | 0.1306854 | 0.0380457 | -0.7010959 | -0.4445988 | 0.7392516 | 0.3495462 | 0.4908826 | 0.7853981 | 1.0968294 |
| | 0.4649358 | 0.4527215 | 0.2024424 | 2.1919717 | 2.6443391 | 0.6499721 | 0.3811432 | | | | | |
| 891 | 0.2311867 | 0.2311866 | 0.5657324 | 0.1296224 | 0.0377260 | -0.7018076 | -0.4450111 | 0.7396678 | 0.3496227 | 0.4908826 | 0.7853981 | 1.0959129 |
| | 0.4629900 | 0.4535232 | 0.2011381 | 2.1924864 | 2.6455944 | 0.6488125 | 0.3796865 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 892 | 0.2301458 | 0.2301457 | 0.5647637 | 0.1285595 | 0.0374063 | -0.7026745 | -0.4454241 | 0.7400808 | 0.3496582 | 0.4908826 | 0.7853981 | 1.0950050 |
| | 0.4613427 | 0.4553257 | 0.1998282 | 2.1929216 | 2.6471062 | 0.6476516 | 0.3782255 | | | | | |
| 893 | 0.2291041 | 0.2291040 | 0.5637953 | 0.1274956 | 0.0373866 | -0.7034095 | -0.4458384 | 0.7404961 | 0.3497748 | 0.4908826 | 0.7853981 | 1.0940914 |
| | 0.4590940 | 0.4551296 | 0.1985127 | 2.1934328 | 2.6486213 | 0.6464918 | 0.3767650 | | | | | |
| 894 | 0.2280621 | 0.2280622 | 0.5628272 | 0.1264310 | 0.0367669 | -0.7041419 | -0.4462510 | 0.7409087 | 0.3498519 | 0.4908826 | 0.7853981 | 1.0931854 |
| | 0.4571450 | 0.4559352 | 0.1971913 | 2.1939487 | 2.6477421 | 0.6453332 | 0.3753048 | | | | | |
| 895 | 0.2270194 | 0.2270193 | 0.5618553 | 0.1253662 | 0.0364472 | -0.7048758 | -0.4466643 | 0.7413230 | 0.3499262 | 0.4908826 | 0.7853981 | 1.0922766 |
| | 0.4551938 | 0.4567403 | 0.1958658 | 2.1944695 | 2.6510668 | 0.6441721 | 0.3738427 | | | | | |
| 896 | 0.2259753 | 0.2259752 | 0.5608819 | 0.1243036 | 0.0361274 | -0.7056098 | -0.4470776 | 0.7417372 | 0.3500002 | 0.4908826 | 0.7853981 | 1.0913687 |
| | 0.4532405 | 0.4575462 | 0.1945350 | 2.1949940 | 2.6523972 | 0.6430105 | 0.3723790 | | | | | |
| 897 | 0.2249312 | 0.2249311 | 0.5599098 | 0.1232345 | 0.0358077 | -0.7063426 | -0.4474897 | 0.7421503 | 0.3500745 | 0.4908826 | 0.7853981 | 1.0904636 |
| | 0.4512872 | 0.4583536 | 0.1931944 | 2.1955233 | 2.6537323 | 0.6418503 | 0.3709155 | | | | | |
| 898 | 0.2238869 | 0.2238868 | 0.5589335 | 0.1221681 | 0.0354881 | -0.7070755 | -0.4479021 | 0.7425636 | 0.3501474 | 0.4908826 | 0.7853981 | 1.0895596 |
| | 0.4493321 | 0.4591612 | 0.1918571 | 2.1960573 | 2.6550732 | 0.6406889 | 0.3694513 | | | | | |
| 899 | 0.2228401 | 0.2228400 | 0.5579547 | 0.1211010 | 0.0351683 | -0.7078056 | -0.4483124 | 0.7429739 | 0.3502179 | 0.4908826 | 0.7853981 | 1.0886621 |
| | 0.4473748 | 0.4599686 | 0.1905152 | 2.1965961 | 2.6564188 | 0.6394252 | 0.3679850 | | | | | |
| 900 | 0.2217942 | 0.2217941 | 0.5569769 | 0.1200332 | 0.0348486 | -0.7085358 | -0.4487089 | 0.7432885 | 0.3503027 | 0.4908826 | 0.7853981 | 1.0879755 |
| | 0.4453809 | 0.4607677 | 0.1891587 | 2.1971493 | 2.6578151 | 0.6383635 | 0.3664714 | | | | | |
| 901 | 0.2207267 | 0.2207265 | 0.5559983 | 0.1189649 | 0.0345289 | -0.7091694 | -0.4490787 | 0.7436983 | 0.3503747 | 0.4908826 | 0.7853981 | 1.0870810 |
| | 0.4434210 | 0.4615775 | 0.1878007 | 2.1976976 | 2.6591711 | 0.6372020 | 0.3650235 | | | | | |
| 902 | 0.2196782 | 0.2196783 | 0.5550162 | 0.1178961 | 0.0342092 | -0.7099006 | -0.4494892 | 0.7441097 | 0.3504441 | 0.4908826 | 0.7853981 | 1.0861835 |
| | 0.4414597 | 0.4623870 | 0.1864381 | 2.1982498 | 2.6605330 | 0.6360383 | 0.3635545 | | | | | |
| 903 | 0.2186297 | 0.2186296 | 0.5540364 | 0.1168266 | 0.0338895 | -0.7106317 | -0.4498997 | 0.7445211 | 0.3505160 | 0.4908826 | 0.7853981 | 1.0852871 |
| | 0.4394981 | 0.4631984 | 0.1850649 | 2.1988077 | 2.6619015 | 0.6348778 | 0.3620856 | | | | | |
| 904 | 0.2175804 | 0.2175803 | 0.5530527 | 0.1157569 | 0.0335698 | -0.7113596 | -0.4503079 | 0.7449294 | 0.3505847 | 0.4908826 | 0.7853981 | 1.0843983 |
| | 0.4375150 | 0.4640097 | 0.1836954 | 2.1993704 | 2.6632748 | 0.6337147 | 0.3606156 | | | | | |
| 905 | 0.2165299 | 0.2165298 | 0.5520678 | 0.1146863 | 0.0332501 | -0.7120919 | -0.4507186 | 0.7453420 | 0.3506533 | 0.4908826 | 0.7853981 | 1.0835009 |
| | 0.4355698 | 0.4648215 | 0.1823158 | 2.1999378 | 2.6646528 | 0.6325514 | 0.3591442 | | | | | |
| 906 | 0.2154788 | 0.2154787 | 0.5510812 | 0.1136152 | 0.0329304 | -0.7128195 | -0.4511265 | 0.7457498 | 0.3507208 | 0.4908826 | 0.7853981 | 1.0826149 |
| | 0.4336032 | 0.4656337 | 0.1809306 | 2.2005110 | 2.6660376 | 0.6313875 | 0.3576719 | | | | | |
| 907 | 0.2144279 | 0.2144269 | 0.5500945 | 0.1125435 | 0.0326107 | -0.7135466 | -0.4515339 | 0.7461573 | 0.3507889 | 0.4908826 | 0.7853981 | 1.0817308 |
| | 0.4316354 | 0.4664469 | 0.1795397 | 2.2010889 | 2.6674240 | 0.6302240 | 0.3561988 | | | | | |
| 908 | 0.2133747 | 0.2133746 | 0.5491068 | 0.1114712 | 0.0322909 | -0.7142754 | -0.4519420 | 0.7465663 | 0.3508565 | 0.4908826 | 0.7853981 | 1.0808430 |
| | 0.4296669 | 0.4672607 | 0.1781430 | 2.2016716 | 2.6688242 | 0.6290619 | 0.3547251 | | | | | |
| 909 | 0.2123215 | 0.2123213 | 0.5481167 | 0.1103985 | 0.0319712 | -0.7150033 | -0.4523493 | 0.7469751 | 0.3509226 | 0.4908826 | 0.7853981 | 1.0799570 |
| | 0.4276965 | 0.4680742 | 0.1767411 | 2.2022610 | 2.6702251 | 0.6278981 | 0.3532503 | | | | | |
| 910 | 0.2112678 | 0.2112677 | 0.5471274 | 0.1093253 | 0.0316516 | -0.7157318 | -0.4527571 | 0.7473834 | 0.3509898 | 0.4908826 | 0.7853981 | 1.0790730 |
| | 0.4257254 | 0.4688893 | 0.1753328 | 2.2028532 | 2.6716328 | 0.6267361 | 0.3517749 | | | | | |
| 911 | 0.2102129 | 0.2102127 | 0.5461337 | 0.1082513 | 0.0313318 | -0.7164574 | -0.4531630 | 0.7477893 | 0.3510540 | 0.4908826 | 0.7853981 | 1.0781946 |
| | 0.4237515 | 0.4697030 | 0.1739194 | 2.2034531 | 2.6730461 | 0.6255710 | 0.3502979 | | | | | |
| 912 | 0.2091572 | 0.2091571 | 0.5451385 | 0.1071768 | 0.0310121 | -0.7171850 | -0.4535683 | 0.7481971 | 0.3511173 | 0.4908826 | 0.7853981 | 1.0773134 |
| | 0.4217767 | 0.4705173 | 0.1725004 | 2.2040577 | 2.6744642 | 0.6244055 | 0.3488201 | | | | | |
| 913 | 0.2081016 | 0.2081015 | 0.5441444 | 0.1061017 | 0.0306924 | -0.7179117 | -0.4539735 | 0.7486036 | 0.3511837 | 0.4908826 | 0.7853981 | 1.0764351 |
| | 0.4198020 | 0.4713337 | 0.1710742 | 2.2046671 | 2.6758890 | 0.6232442 | 0.3473424 | | | | | |
| 914 | 0.2070444 | 0.2070442 | 0.5431486 | 0.1050261 | 0.0303727 | -0.7186380 | -0.4543786 | 0.7490107 | 0.3512460 | 0.4908826 | 0.7853981 | 1.0755568 |
| | 0.4178239 | 0.4721485 | 0.1696433 | 2.2052832 | 2.6773195 | 0.6220785 | 0.3458624 | | | | | |
| 915 | 0.2059866 | 0.2059865 | 0.5421508 | 0.1039498 | 0.0300530 | -0.7193621 | -0.4547860 | 0.7494151 | 0.3513087 | 0.4908826 | 0.7853981 | 1.0746851 |
| | 0.4158450 | 0.4729639 | 0.1682063 | 2.2059053 | 2.6787558 | 0.6209139 | 0.3443820 | | | | | |
| 916 | 0.2049279 | 0.2049278 | 0.5411515 | 0.1028730 | 0.0297332 | -0.7200875 | -0.4551907 | 0.7498208 | 0.3513707 | 0.4908826 | 0.7853981 | 1.0738115 |
| | 0.4138644 | 0.4737794 | 0.1667632 | 2.2065325 | 2.6801987 | 0.6197491 | 0.3429005 | | | | | |
| 917 | 0.2038694 | 0.2038693 | 0.5401530 | 0.1017958 | 0.0294136 | -0.7208107 | -0.4555942 | 0.7502242 | 0.3514336 | 0.4908826 | 0.7853981 | 1.0729427 |
| | 0.4118840 | 0.4745959 | 0.1653138 | 2.2071657 | 2.6816473 | 0.6185863 | 0.3414192 | | | | | |
| 918 | 0.2028094 | 0.2028093 | 0.5391505 | 0.1007178 | 0.0290939 | -0.7215375 | -0.4559994 | 0.7506313 | 0.3514939 | 0.4908826 | 0.7853981 | 1.0720673 |
| | 0.4099010 | 0.4754114 | 0.1638590 | 2.2078047 | 2.6831007 | 0.6174208 | 0.3399361 | | | | | |
| 919 | 0.2017490 | 0.2017488 | 0.5381487 | 0.0996393 | 0.0287741 | -0.7222599 | -0.4564021 | 0.7510340 | 0.3515552 | 0.4908826 | 0.7853981 | 1.0712023 |
| | 0.4079171 | 0.4762277 | 0.1623974 | 2.2084503 | 2.6845617 | 0.6162571 | 0.3384525 | | | | | |
| 920 | 0.2006872 | 0.2006871 | 0.5371435 | 0.0985602 | 0.0284544 | -0.7229830 | -0.4568054 | 0.7514383 | 0.3516144 | 0.4908826 | 0.7853981 | 1.0703344 |
| | 0.4059308 | 0.4770437 | 0.1609303 | 2.2091017 | 2.6860285 | 0.6150913 | 0.3369672 | | | | | |
| 921 | 0.1996248 | 0.1996247 | 0.5361370 | 0.0974804 | 0.0281347 | -0.7237079 | -0.4572087 | 0.7518426 | 0.3516733 | 0.4908826 | 0.7853981 | 1.0694675 |
| | 0.4039431 | 0.4778587 | 0.1594570 | 2.2097597 | 2.6875016 | 0.6139255 | 0.3354810 | | | | | |
| 922 | 0.1985615 | 0.1985614 | 0.5351293 | 0.0964001 | 0.0278150 | -0.7244290 | -0.4576101 | 0.7522440 | 0.3517311 | 0.4908826 | 0.7853981 | 1.0686073 |
| | 0.4019537 | 0.4786739 | 0.1579775 | 2.2104244 | 2.6889801 | 0.6127596 | 0.3339938 | | | | | |
| 923 | 0.1974980 | 0.1974978 | 0.5341209 | 0.0953194 | 0.0274953 | -0.7251514 | -0.4580119 | 0.7526467 | 0.3517888 | 0.4908826 | 0.7853981 | 1.0677452 |
| | 0.3999640 | 0.4794890 | 0.1564919 | 2.2110949 | 2.6904650 | 0.6115944 | 0.3325064 | | | | | |
| 924 | 0.1964332 | 0.1964331 | 0.5331118 | 0.0942380 | 0.0271756 | -0.7258719 | -0.4584126 | 0.7530475 | 0.3518460 | 0.4908826 | 0.7853981 | 1.0668879 |
| | 0.3979722 | 0.4803041 | 0.1549998 | 2.2117720 | 2.6919565 | 0.6104299 | 0.3310176 | | | | | |
| 925 | 0.1953679 | 0.1953678 | 0.5321027 | 0.0931559 | 0.0268559 | -0.7265904 | -0.4588155 | 0.7534522 | 0.3519022 | 0.4908826 | 0.7853981 | 1.0660229 |
| | 0.3959793 | 0.4811189 | 0.1535014 | 2.2124544 | 2.6934538 | 0.6092631 | 0.3295280 | | | | | |
| 926 | 0.1943014 | 0.1943013 | 0.5310854 | 0.0920733 | 0.0265362 | -0.7273157 | -0.4592152 | 0.7538519 | 0.3519564 | 0.4908826 | 0.7853981 | 1.0651693 |
| | 0.3939839 | 0.4819324 | 0.1519971 | 2.2131462 | 2.6949577 | 0.6080953 | 0.3280367 | | | | | |
| 927 | 0.1932341 | 0.1932340 | 0.5300684 | 0.0909901 | 0.0262164 | -0.7280367 | -0.4596155 | 0.7542541 | 0.3520101 | 0.4908826 | 0.7853981 | 1.0643129 |
| | 0.3919873 | 0.4827457 | 0.1504864 | 2.2138433 | 2.6964674 | 0.6069270 | 0.3265449 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 928 | 0.1921661 | 0.1921663 | 0.5290529 | 0.0899062 | 0.0258967 | -0.7287578 | -0.4600159 | 0.7546545 | 0.3520648 | 0.4908826 | 0.7853981 | 1.0634575 |
| | 0.3899893 | 0.4835591 | 0.1489687 | 2.2145472 | 2.6979847 | 0.6057618 | 0.3250520 | | | | | |
| 929 | 0.1910980 | 0.1910979 | 0.5280369 | 0.0888218 | 0.0255770 | -0.7296759 | -0.4604143 | 0.7550529 | 0.3521195 | 0.4908826 | 0.7853981 | 1.0626087 |
| | 0.3879908 | 0.4843726 | 0.1474443 | 2.2152586 | 2.6995087 | 0.6045969 | 0.3235591 | | | | | |
| 930 | 0.1900290 | 0.1900288 | 0.5270185 | 0.0877369 | 0.0252573 | -0.7301958 | -0.4608135 | 0.7554531 | 0.3521726 | 0.4908826 | 0.7853981 | 1.0617571 |
| | 0.3859909 | 0.4851848 | 0.1459140 | 2.2159767 | 2.7010384 | 0.6034309 | 0.3220652 | | | | | |
| 931 | 0.1889445 | 0.1889444 | 0.5259998 | 0.0866513 | 0.0249376 | -0.7306406 | -0.4611711 | 0.7557783 | 0.3522359 | 0.4908826 | 0.7853981 | 1.0610657 |
| | 0.3839621 | 0.4859870 | 0.1443765 | 2.2167120 | 2.7026081 | 0.6022659 | 0.3205498 | | | | | |
| 932 | 0.1878725 | 0.1878724 | 0.5249757 | 0.0855651 | 0.0246179 | -0.7315581 | -0.4615688 | 0.7561760 | 0.3522857 | 0.4908826 | 0.7853981 | 1.0602207 |
| | 0.3819567 | 0.4867964 | 0.1428334 | 2.2174454 | 2.7041512 | 0.6010968 | 0.3190521 | | | | | |
| 933 | 0.1868009 | 0.1868008 | 0.5239521 | 0.0844783 | 0.0242982 | -0.7322747 | -0.4619657 | 0.7565729 | 0.3523362 | 0.4908826 | 0.7853981 | 1.0593777 |
| | 0.3799516 | 0.4876062 | 0.1412831 | 2.2181864 | 2.7057009 | 0.5999297 | 0.3175553 | | | | | |
| 934 | 0.1857288 | 0.1857287 | 0.5229298 | 0.0833908 | 0.0239785 | -0.7329932 | -0.4623636 | 0.7569717 | 0.3523883 | 0.4908826 | 0.7853981 | 1.0585318 |
| | 0.3779460 | 0.4884162 | 0.1397254 | 2.2189341 | 2.7072582 | 0.5987653 | 0.3160574 | | | | | |
| 935 | 0.1846551 | 0.1846550 | 0.5219028 | 0.0823027 | 0.0236588 | -0.7337093 | -0.4627599 | 0.7573680 | 0.3524371 | 0.4908826 | 0.7853981 | 1.0576916 |
| | 0.3759375 | 0.4892239 | 0.1381618 | 2.2196894 | 2.7088213 | 0.5975974 | 0.3145579 | | | | | |
| 936 | 0.1835814 | 0.1835813 | 0.5208765 | 0.0812143 | 0.0233391 | -0.7344267 | -0.4631568 | 0.7577658 | 0.3524867 | 0.4908826 | 0.7853981 | 1.0568495 |
| | 0.3739285 | 0.4900311 | 0.1365913 | 2.2204533 | 2.7103910 | 0.5964317 | 0.3130584 | | | | | |
| 937 | 0.1825066 | 0.1825064 | 0.5198476 | 0.0801250 | 0.0230194 | -0.7351443 | -0.4635536 | 0.7581636 | 0.3525348 | 0.4908826 | 0.7853981 | 1.0560074 |
| | 0.3719177 | 0.4908372 | 0.1350138 | 2.2212248 | 2.7119675 | 0.5952648 | 0.3115576 | | | | | |
| 938 | 0.1814307 | 0.1814306 | 0.5188178 | 0.0790352 | 0.0226997 | -0.7358609 | -0.4639496 | 0.7585606 | 0.3525831 | 0.4908826 | 0.7853981 | 1.0551682 |
| | 0.3699051 | 0.4916421 | 0.1334293 | 2.2220039 | 2.7135515 | 0.5940983 | 0.3100555 | | | | | |
| 939 | 0.1803539 | 0.1803538 | 0.5177848 | 0.0779447 | 0.0223799 | -0.7365757 | -0.4643447 | 0.7589557 | 0.3526290 | 0.4908826 | 0.7853981 | 1.0543337 |
| | 0.3678905 | 0.4924452 | 0.1318383 | 2.2227917 | 2.7151423 | 0.5929303 | 0.3085573 | | | | | |
| 940 | 0.1792770 | 0.1792769 | 0.5167540 | 0.0768536 | 0.0220602 | -0.7372934 | -0.4647408 | 0.7593536 | 0.3526771 | 0.4908826 | 0.7853981 | 1.0534935 |
| | 0.3658759 | 0.4932484 | 0.1302395 | 2.2235870 | 2.7167397 | 0.5917657 | 0.3070491 | | | | | |
| 941 | 0.1781991 | 0.1781990 | 0.5157201 | 0.0757619 | 0.0217405 | -0.7380070 | -0.4651346 | 0.7597475 | 0.3527233 | 0.4908826 | 0.7853981 | 1.0526628 |
| | 0.3638592 | 0.4940497 | 0.1286340 | 2.2243919 | 2.7183447 | 0.5905995 | 0.3055488 | | | | | |
| 942 | 0.1771201 | 0.1771200 | 0.5146844 | 0.0746698 | 0.0214208 | -0.7387204 | -0.4655283 | 0.7601412 | 0.3527685 | 0.4908826 | 0.7853981 | 1.0518332 |
| | 0.3618408 | 0.4948487 | 0.1270219 | 2.2252045 | 2.7199569 | 0.5894330 | 0.3040492 | | | | | |
| 943 | 0.1760406 | 0.1760405 | 0.5136473 | 0.0735768 | 0.0211011 | -0.7394373 | -0.4659237 | 0.7605385 | 0.3528129 | 0.4908826 | 0.7853981 | 1.0509968 |
| | 0.3598211 | 0.4956468 | 0.1254022 | 2.2260265 | 2.7215748 | 0.5882667 | 0.3025430 | | | | | |
| 944 | 0.1749607 | 0.1749606 | 0.5126112 | 0.0724832 | 0.0207814 | -0.7401497 | -0.4663163 | 0.7609311 | 0.3528588 | 0.4908826 | 0.7853981 | 1.0501709 |
| | 0.3578008 | 0.4964440 | 0.1237750 | 2.2268562 | 2.7232018 | 0.5871027 | 0.3010265 | | | | | |
| 945 | 0.1738788 | 0.1738787 | 0.5115691 | 0.0713891 | 0.0204617 | -0.7408626 | -0.4667095 | 0.7613252 | 0.3529005 | 0.4908826 | 0.7853981 | 1.0493431 |
| | 0.3557768 | 0.4972376 | 0.1221414 | 2.2276964 | 2.7248344 | 0.5859342 | 0.2995174 | | | | | |
| 946 | 0.1727968 | 0.1727967 | 0.5105240 | 0.0702943 | 0.0201420 | -0.7415757 | -0.4671019 | 0.7617177 | 0.3529434 | 0.4908826 | 0.7853981 | 1.0485182 |
| | 0.3537523 | 0.4980304 | 0.1205031 | 2.2285452 | 2.7264757 | 0.5847683 | 0.2980082 | | | | | |
| 947 | 0.1717139 | 0.1717138 | 0.5094846 | 0.0691988 | 0.0198222 | -0.7422909 | -0.4674954 | 0.7621131 | 0.3529848 | 0.4908826 | 0.7853981 | 1.0476885 |
| | 0.3517266 | 0.4988209 | 0.1188817 | 2.2294025 | 2.7281227 | 0.5836016 | 0.2964962 | | | | | |
| 948 | 0.1706305 | 0.1706304 | 0.5084434 | 0.0681027 | 0.0195025 | -0.7430017 | -0.4678886 | 0.7625042 | 0.3530289 | 0.4908826 | 0.7853981 | 1.0468683 |
| | 0.3496999 | 0.4996107 | 0.1171949 | 2.2302694 | 2.7297792 | 0.5824386 | 0.2949877 | | | | | |
| 949 | 0.1695468 | 0.1695467 | 0.5074009 | 0.0670062 | 0.0191829 | -0.7437120 | -0.4682772 | 0.7628949 | 0.3530720 | 0.4908826 | 0.7853981 | 1.0460501 |
| | 0.3476723 | 0.5003982 | 0.1155312 | 2.2311459 | 2.7314425 | 0.5812758 | 0.2934769 | | | | | |
| 950 | 0.1684617 | 0.1684616 | 0.5063539 | 0.0659089 | 0.0188631 | -0.7444242 | -0.4686683 | 0.7632874 | 0.3531120 | 0.4908826 | 0.7853981 | 1.0452280 |
| | 0.3456421 | 0.5011824 | 0.1138603 | 2.2320328 | 2.7331123 | 0.5801100 | 0.2919644 | | | | | |
| 951 | 0.1673758 | 0.1673757 | 0.5053068 | 0.0648109 | 0.0185434 | -0.7451380 | -0.4690609 | 0.7636814 | 0.3531528 | 0.4908826 | 0.7853981 | 1.0444040 |
| | 0.3436106 | 0.5019649 | 0.1121915 | 2.2329292 | 2.7347898 | 0.5789459 | 0.2904511 | | | | | |
| 952 | 0.1662895 | 0.1662894 | 0.5042602 | 0.0637123 | 0.0182237 | -0.7458474 | -0.4694506 | 0.7640711 | 0.3531943 | 0.4908826 | 0.7853981 | 1.0435896 |
| | 0.3415784 | 0.5027455 | 0.1104948 | 2.2338352 | 2.7364759 | 0.5777838 | 0.2889379 | | | | | |
| 953 | 0.1652023 | 0.1652022 | 0.5032119 | 0.0626131 | 0.0179040 | -0.7465585 | -0.4698411 | 0.7644625 | 0.3532349 | 0.4908826 | 0.7853981 | 1.0427723 |
| | 0.3395444 | 0.5035234 | 0.1088036 | 2.2347517 | 2.7381697 | 0.5766214 | 0.2874220 | | | | | |
| 954 | 0.1641141 | 0.1641140 | 0.5021612 | 0.0615132 | 0.0175843 | -0.7472697 | -0.4702295 | 0.7648510 | 0.3532743 | 0.4908826 | 0.7853981 | 1.0419617 |
| | 0.3375086 | 0.5042982 | 0.1070969 | 2.2356787 | 2.7398710 | 0.5754582 | 0.2859064 | | | | | |
| 955 | 0.1630141 | 0.1630139 | 0.5011088 | 0.0604130 | 0.0172646 | -0.7479775 | -0.4706164 | 0.7652421 | 0.3533198 | 0.4908826 | 0.7853981 | 1.0412712 |
| | 0.3354506 | 0.5050603 | 0.1053459 | 2.2366257 | 2.7416056 | 0.5742952 | 0.2843748 | | | | | |
| 956 | 0.1619231 | 0.1619230 | 0.5000518 | 0.0593119 | 0.0169449 | -0.7486850 | -0.4709992 | 0.7656399 | 0.3533654 | 0.4908826 | 0.7853981 | 1.0404634 |
| | 0.3334097 | 0.5058277 | 0.1036733 | 2.2375745 | 2.7433224 | 0.5731291 | 0.2828556 | | | | | |
| 957 | 0.1608321 | 0.1608319 | 0.4989955 | 0.0582101 | 0.0166252 | -0.7493946 | -0.4713831 | 0.7660398 | 0.3534116 | 0.4908826 | 0.7853981 | 1.0396519 |
| | 0.3313683 | 0.5065922 | 0.1019486 | 2.2385349 | 2.7450466 | 0.5719602 | 0.2813366 | | | | | |
| 958 | 0.1597404 | 0.1597403 | 0.4979377 | 0.0571077 | 0.0163054 | -0.7501035 | -0.4717613 | 0.7664419 | 0.3534271 | 0.4908826 | 0.7853981 | 1.0388432 |
| | 0.3293263 | 0.5073542 | 0.1002159 | 2.2395048 | 2.7467785 | 0.5707916 | 0.2798179 | | | | | |
| 959 | 0.1586474 | 0.1586472 | 0.4968768 | 0.0560047 | 0.0159857 | -0.7508101 | -0.4721342 | 0.7667458 | 0.3534608 | 0.4908826 | 0.7853981 | 1.0380383 |
| | 0.3272812 | 0.5081119 | 0.0984756 | 2.2404881 | 2.7485180 | 0.5696205 | 0.2782957 | | | | | |
| 960 | 0.1575539 | 0.1575537 | 0.4958149 | 0.0549011 | 0.0156660 | -0.7515166 | -0.4725070 | 0.7671266 | 0.3534940 | 0.4908826 | 0.7853981 | 1.0372267 |
| | 0.3252354 | 0.5088665 | 0.0967272 | 2.2414818 | 2.7502551 | 0.5684471 | 0.2767690 | | | | | |
| 961 | 0.1564595 | 0.1564593 | 0.4947531 | 0.0537967 | 0.0153463 | -0.7522230 | -0.4728797 | 0.7675123 | 0.3535281 | 0.4908826 | 0.7853981 | 1.0364265 |
| | 0.3231881 | 0.5096177 | 0.0949785 | 2.2424878 | 2.7520416 | 0.5672695 | 0.2752414 | | | | | |
| 962 | 0.1553646 | 0.1553645 | 0.4936886 | 0.0526920 | 0.0150266 | -0.7529294 | -0.4732496 | 0.7679000 | 0.3535600 | 0.4908826 | 0.7853981 | 1.0356226 |
| | 0.3211397 | 0.5103647 | 0.0932063 | 2.2435045 | 2.7537851 | 0.5660900 | 0.2737095 | | | | | |
| 963 | 0.1542682 | 0.1542681 | 0.4926222 | 0.0515869 | 0.0147059 | -0.7536352 | -0.4736186 | 0.7682871 | 0.3535913 | 0.4908826 | 0.7853981 | 1.0348206 |
| | 0.3191386 | 0.5111076 | 0.0914335 | 2.2445345 | 2.7555571 | 0.5649081 | 0.2721733 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 964 | 0.1531714 | 0.1531712 | 0.4915554 | 0.0504801 | 0.0143872 | -0.7542851 | -0.4740708 | 0.7686723 | 0.3536229 | 0.4908826 | 0.7853981 | 1.0340233 |
| | 0.3170366 | 0.5118464 | 0.0896524 | 2.2465769 | 2.7573376 | 0.5638196 | 0.2706785 | | | | | |
| 965 | 0.1520734 | 0.1520733 | 0.4904854 | 0.0493732 | 0.0140675 | -0.7549912 | -0.4744503 | 0.7690586 | 0.3536524 | 0.4908826 | 0.7853981 | 1.0332241 |
| | 0.3149825 | 0.5125806 | 0.0878633 | 2.2466316 | 2.7591257 | 0.5626559 | 0.2691520 | | | | | |
| 966 | 0.1509746 | 0.1509745 | 0.4894145 | 0.0482657 | 0.0137478 | -0.7556972 | -0.4748416 | 0.7694449 | 0.3536816 | 0.4908826 | 0.7853981 | 1.0324259 |
| | 0.3129267 | 0.5133104 | 0.0860657 | 2.2476997 | 2.7609224 | 0.5614927 | 0.2676247 | | | | | |
| 967 | 0.1498753 | 0.1498752 | 0.4883437 | 0.0471575 | 0.0134280 | -0.7564006 | -0.4752253 | 0.7698286 | 0.3537113 | 0.4908826 | 0.7853981 | 1.0316334 |
| | 0.3108701 | 0.5140359 | 0.0842596 | 2.2487803 | 2.7627287 | 0.5603315 | 0.2661971 | | | | | |
| 968 | 0.1487747 | 0.1487746 | 0.4872682 | 0.0460488 | 0.0131064 | -0.7571077 | -0.4756108 | 0.7702160 | 0.3537376 | 0.4908826 | 0.7853981 | 1.0308342 |
| | 0.3088112 | 0.5147554 | 0.0824458 | 2.2498741 | 2.7645407 | 0.5591675 | 0.2646680 | | | | | |
| 969 | 0.1476732 | 0.1476731 | 0.4861923 | 0.0449393 | 0.0127867 | -0.7578102 | -0.4759936 | 0.7705989 | 0.3537645 | 0.4908826 | 0.7853981 | 1.0300446 |
| | 0.3067505 | 0.5154706 | 0.0806229 | 2.2509823 | 2.7663631 | 0.5580048 | 0.2631479 | | | | | |
| 970 | 0.1465711 | 0.1465710 | 0.4851160 | 0.0438291 | 0.0124694 | -0.7585142 | -0.4763769 | 0.7709831 | 0.3537916 | 0.4908826 | 0.7853981 | 1.0292530 |
| | 0.3046886 | 0.5161803 | 0.0787914 | 2.2521138 | 2.7681942 | 0.5568435 | 0.2616373 | | | | | |
| 971 | 0.1454685 | 0.1454684 | 0.4840392 | 0.0427183 | 0.0121492 | -0.7592180 | -0.4767600 | 0.7713672 | 0.3538186 | 0.4908826 | 0.7853981 | 1.0284624 |
| | 0.3026260 | 0.5168855 | 0.0769510 | 2.2532387 | 2.7700338 | 0.5556830 | 0.2599763 | | | | | |
| 972 | 0.1443644 | 0.1443643 | 0.4829583 | 0.0416066 | 0.0118295 | -0.7599215 | -0.4771429 | 0.7717510 | 0.3538430 | 0.4908826 | 0.7853981 | 1.0276728 |
| | 0.3005604 | 0.5175838 | 0.0751023 | 2.2543488 | 2.7718811 | 0.5545213 | 0.2584436 | | | | | |
| 973 | 0.1432598 | 0.1432596 | 0.4818779 | 0.0404946 | 0.0115098 | -0.7606222 | -0.4775239 | 0.7721320 | 0.3538684 | 0.4908826 | 0.7853981 | 1.0268898 |
| | 0.2984936 | 0.5182770 | 0.0732446 | 2.2553542 | 2.7737389 | 0.5531615 | 0.2569105 | | | | | |
| 974 | 0.1421549 | 0.1421549 | 0.4807966 | 0.0393819 | 0.0111901 | -0.7613273 | -0.4779074 | 0.7725174 | 0.3538932 | 0.4908826 | 0.7853981 | 1.0260983 |
| | 0.2964268 | 0.5189644 | 0.0713784 | 2.2563729 | 2.7756033 | 0.5522026 | 0.2553775 | | | | | |
| 975 | 0.1410389 | 0.1410388 | 0.4797110 | 0.0382684 | 0.0108704 | -0.7620293 | -0.4782916 | 0.7728997 | 0.3539216 | 0.4908826 | 0.7853981 | 1.0254164 |
| | 0.2943391 | 0.5196342 | 0.0695033 | 2.2573974 | 2.7775302 | 0.5510414 | 0.2538244 | | | | | |
| 976 | 0.1399316 | 0.1399316 | 1.4786263 | 0.0371542 | 0.0105507 | -0.7626790 | -0.4786416 | 0.7732297 | 0.3539453 | 0.4908826 | 0.7853981 | 1.0246372 |
| | 0.2922675 | 0.5203086 | 0.0676197 | 2.2584476 | 2.7793836 | 0.5498829 | 0.2522937 | | | | | |
| 977 | 0.1388238 | 0.1388237 | 0.4775401 | 0.0360394 | 0.0102310 | -0.7633805 | -0.4790224 | 0.7736114 | 0.3539680 | 0.4908826 | 0.7853981 | 1.0238552 |
| | 0.2901947 | 0.5209759 | 0.0657257 | 2.2594741 | 2.7812767 | 0.5487248 | 0.2507576 | | | | | |
| 978 | 0.1377152 | 0.1377151 | 0.4764530 | 0.0349236 | 0.0099112 | -0.7640820 | -0.4794032 | 0.7739932 | 0.3539906 | 0.4908826 | 0.7853981 | 1.0230732 |
| | 0.2881203 | 0.5216366 | 0.0638242 | 2.2605158 | 2.7831763 | 0.5475678 | 0.2492208 | | | | | |
| 979 | 0.1366054 | 0.1366053 | 0.4753631 | 0.0338076 | 0.0095915 | -0.7647807 | -0.4797842 | 0.7743722 | 0.3540114 | 0.4908826 | 0.7853981 | 1.0222979 |
| | 0.2860447 | 0.5222895 | 0.0619119 | 2.2615736 | 2.7850695 | 0.5464099 | 0.2476828 | | | | | |
| 980 | 0.1354944 | 0.1354947 | 0.4742719 | 0.0326908 | 0.0092716 | -0.7654806 | -0.4801615 | 0.7747524 | 0.3540319 | 0.4908826 | 0.7853981 | 1.0215206 |
| | 0.2839667 | 0.5229349 | 0.0599912 | 2.2626497 | 2.7870332 | 0.5452527 | 0.2461441 | | | | | |
| 981 | 0.1343837 | 0.1343837 | 0.4731802 | 0.0315734 | 0.0089521 | -0.7661825 | -0.4805419 | 0.7751347 | 0.3540522 | 0.4908826 | 0.7853981 | 1.0207405 |
| | 0.2818882 | 0.5235727 | 0.0580616 | 2.2636409 | 2.7889376 | 0.5440970 | 0.2446051 | | | | | |
| 982 | 0.1332709 | 0.1332709 | 0.4720843 | 0.0304552 | 0.0086324 | -0.7668833 | -0.4809194 | 0.7755127 | 0.3540699 | 0.4908826 | 0.7853981 | 1.0199693 |
| | 0.2798064 | 0.5242015 | 0.0561227 | 2.2646513 | 2.7908764 | 0.5429391 | 0.2430642 | | | | | |
| 983 | 0.1321573 | 0.1321572 | 0.4709871 | 0.0293363 | 0.0083127 | -0.7675793 | -0.4812981 | 0.7758920 | 0.3540872 | 0.4908826 | 0.7853981 | 1.0191946 |
| | 0.2777230 | 0.5248220 | 0.0541743 | 2.2656784 | 2.7928238 | 0.5417819 | 0.2415224 | | | | | |
| 984 | 0.1310434 | 0.1310433 | 0.4698909 | 0.0282167 | 0.0079930 | -0.7682782 | -0.4816764 | 0.7762712 | 0.3541058 | 0.4908826 | 0.7853981 | 1.0184221 |
| | 0.2756390 | 0.5254348 | 0.0522162 | 2.2666244 | 2.7947807 | 0.5406277 | 0.2399808 | | | | | |
| 985 | 0.1299284 | 0.1299284 | 0.4687923 | 0.0270964 | 0.0076733 | -0.7689744 | -0.4820529 | 0.7766477 | 0.3541229 | 0.4908826 | 0.7853981 | 1.0176554 |
| | 0.2735532 | 0.5260383 | 0.0502486 | 2.2676482 | 2.7967402 | 0.5394732 | 0.2384381 | | | | | |
| 986 | 0.1288123 | 0.1288123 | 0.4676911 | 0.0259754 | 0.0073535 | -0.7696721 | -0.4824333 | 0.7770256 | 0.3541387 | 0.4908826 | 0.7853981 | 1.0168858 |
| | 0.2714669 | 0.5266322 | 0.0482717 | 2.2686502 | 2.7987242 | 0.5383181 | 0.2368963 | | | | | |
| 987 | 0.1276955 | 0.1276954 | 0.4665834 | 0.0248540 | 0.0070339 | -0.7703695 | -0.4828067 | 0.7774034 | 0.3541535 | 0.4908826 | 0.7853981 | 1.0161180 |
| | 0.2693757 | 0.5272163 | 0.0462854 | 2.2696499 | 2.8007097 | 0.5371636 | 0.2353550 | | | | | |
| 988 | 0.1265782 | 0.1265781 | 0.4654863 | 0.0237316 | 0.0067142 | -0.7710670 | -0.4831835 | 0.7777811 | 0.3541695 | 0.4908826 | 0.7853981 | 1.0153503 |
| | 0.2672854 | 0.5277913 | 0.0442890 | 2.2706469 | 2.8027048 | 0.5360118 | 0.2338054 | | | | | |
| 989 | 0.1254597 | 0.1254597 | 0.4643818 | 0.0226086 | 0.0063944 | -0.7717634 | -0.4835593 | 0.7781578 | 0.3541843 | 0.4908826 | 0.7853981 | 1.0145855 |
| | 0.2651929 | 0.5283559 | 0.0422828 | 2.2716368 | 2.8047104 | 0.5348598 | 0.2322568 | | | | | |
| 990 | 0.1243322 | 0.1243321 | 0.4632731 | 0.0214849 | 0.0060747 | -0.7724590 | -0.4839432 | 0.7785437 | 0.3542011 | 0.4908826 | 0.7853981 | 1.0138246 |
| | 0.2631834 | 0.5289066 | 0.0402673 | 2.2726102 | 2.8067446 | 0.5337057 | 0.2307021 | | | | | |
| 991 | 0.1232118 | 0.1232117 | 0.4621648 | 0.0203605 | 0.0057550 | -0.7731549 | -0.4843285 | 0.7789699 | 0.3542138 | 0.4908826 | 0.7853981 | 1.0130676 |
| | 0.2609875 | 0.5294409 | 0.0382411 | 2.2735732 | 2.8087892 | 0.5325540 | 0.2291568 | | | | | |
| 992 | 0.1220909 | 0.1220907 | 0.4610568 | 0.0192354 | 0.0054353 | -0.7738486 | -0.4847023 | 0.7792439 | 0.3542274 | 0.4908826 | 0.7853981 | 1.0123144 |
| | 0.2588900 | 0.5299725 | 0.0362051 | 2.2745341 | 2.8108453 | 0.5314050 | 0.2276070 | | | | | |
| 993 | 0.1209691 | 0.1209691 | 0.4599475 | 0.0181095 | 0.0051156 | -0.7745417 | -0.4850869 | 0.7796193 | 0.3542405 | 0.4908826 | 0.7853981 | 1.0115643 |
| | 0.2567718 | 0.5304925 | 0.0341590 | 2.2754940 | 2.8129100 | 0.5302564 | 0.2260594 | | | | | |
| 994 | 0.1198465 | 0.1198465 | 0.4588359 | 0.0169832 | 0.0047959 | -0.7752383 | -0.4854739 | 0.7799942 | 0.3542520 | 0.4908826 | 0.7853981 | 1.0108162 |
| | 0.2546916 | 0.5310100 | 0.0321033 | 2.2764514 | 2.8149852 | 0.5291084 | 0.2245102 | | | | | |
| 995 | 0.1187226 | 0.1187226 | 0.4577222 | 0.0158560 | 0.0044762 | -0.7759367 | -0.4858636 | 0.7803669 | 0.3542629 | 0.4908826 | 0.7853981 | 1.0101128 |
| | 0.2525893 | 0.5314946 | 0.0301371 | 2.2773934 | 2.8170708 | 0.5279604 | 0.2229632 | | | | | |
| 996 | 0.1175984 | 0.1175984 | 0.4565040 | 0.0147281 | 0.0041565 | -0.7766350 | -0.4862572 | 0.7807415 | 0.3542745 | 0.4908826 | 0.7853981 | 1.0093565 |
| | 0.2504857 | 0.5319771 | 0.0279605 | 2.2783190 | 2.8191670 | 0.5268114 | 0.2214193 | | | | | |
| 997 | 0.1164734 | 0.1164733 | 0.4553936 | 0.0135994 | 0.0038368 | -0.7773309 | -0.4866546 | 0.7811176 | 0.3542847 | 0.4908826 | 0.7853981 | 1.0085974 |
| | 0.2483810 | 0.5324461 | 0.0258716 | 2.2792334 | 2.8211817 | 0.5256695 | 0.2198788 | | | | | |
| 998 | 0.1153463 | 0.1153463 | 0.4542729 | 0.0124701 | 0.0035170 | -0.7780270 | -0.4870557 | 0.7814944 | 0.3542924 | 0.4908826 | 0.7853981 | 1.0078487 |
| | 0.2462724 | 0.5329094 | 0.0237765 | 2.2801398 | 2.8232208 | 0.5245220 | 0.2183391 | | | | | |
| 999 | 0.1142193 | 0.1142192 | 0.4531551 | 0.0113401 | 0.0031973 | -0.7787249 | -0.4874607 | 0.7818623 | 0.3543012 | 0.4908826 | 0.7853981 | 1.0070963 |
| | 0.2441640 | 0.5333401 | 0.0216698 | 2.2810366 | 2.8253355 | 0.5233779 | 0.2167951 | | | | | |

```
1000 0.1130915 0.1130914 0.4521347 0.0102095 0.0028777-0.7793572-0.4876468 0.7822348 0.3543090 0.4908826 0.7853981 1.0063457
     0.2420539 0.5337652 0.0195510 2.2937593 2.8274527 0.5222344 0.2152025
1001 0.1119629 0.1119628 0.4510139 0.0090781 0.0025579-0.7800496-0.4880185 0.7826076 0.3543174 0.4908826 0.7853981 1.0055962
     0.2399425 0.5341758 0.0174221 2.2954779 2.8295803 0.5210929 0.2136496
1002 0.1108331 0.1108330 0.4498937 0.0079459 0.0022382-0.7807413-0.4883395 0.7829795 0.3543243 0.4908826 0.7853981 1.0048485
     0.2378289 0.5345701 0.0152826 2.2972231 2.8317194 0.5199513 0.2120955
1003 0.1096954 0.1096954 0.4487638 0.0068130 0.0019185-0.7813975-0.4887413 0.7833160 0.3543333 0.4908826 0.7853981 1.0041723
     0.2357005 0.5349368 0.0131325 2.2990065 2.8338442 0.5188085 0.2105315
1004 0.1085638 0.1085637 0.4476379 0.0056794 0.0015988-0.7820862-0.4891102 0.7836850 0.3543393 0.4908826 0.7853981 1.0034323
     0.2335833 0.5352975 0.0109714 2.3008070 2.8360453 0.5176690 0.2089762
1005 0.1074314 0.1074314 0.4465105 0.0045451 0.0012791-0.7827792-0.4894415 0.7840583 0.3543447 0.4908826 0.7853981 1.0026827
     0.2314650 0.5356407 0.0087994 2.3026352 2.8382158 0.5165305 0.2074208
1006 0.1062984 0.1062984 0.4453831 0.0034103 0.0009594-0.7834653-0.4897729 0.7844247 0.3543505 0.4908826 0.7853981 1.0019484
     0.2293453 0.5359660 0.0066163 2.3044930 2.8403988 0.5153944 0.2058651
1007 0.1051636 0.1051635 0.4442499 0.0022745 0.0006397-0.7841567-0.4901048 0.7847964 0.3543564 0.4908826 0.7853981 1.0012035
     0.2272223 0.5362710 0.0044230 2.3063812 2.8425913 0.5142568 0.2043077
1008 0.1040277 0.1040277 0.4431146 0.0011381 0.0003200-0.7848461-0.4904375 0.7851660 0.3543531 0.4908826 0.7853981 1.0004644
     0.2250972 0.5365568 0.0022179 2.3083010 2.8447952 0.5131158 0.2027496
1009 0.1028916 0.1028916 0.4419811 0.0000000 0.0000002-0.7855350-0.4907698 0.7855353 0.3543559 0.4908826 0.7853981 0.9997259
     0.2229718 0.5368233 0.0000017 2.3102503 2.8470136 0.5119811 0.2011918
   0.44198  0.61444  3.55802 -0.51198
```

1 IMAGE PLANE SPOT DIAGRAM ANALYSIS:

THICKNESS =0.0570000 U =0.0 ALFAP =0.0 P =1.0000000

CENTROID: ZCENTR = 0.0, YCENTR = 0.0026398

STANDARD DEVIATIONS: SIGMAY = 0.0000121 SIGMAZ = 0.0000207

RMS SPOT SIZE: RMSRAD = 0.0057336

SPOT DIAGRAM ENERGY DENSITY VS. RADIUS FROM CENTROID:

| IZA | RADIUS | FRACTION |
|---|---|---|
| 1 | 0.0050000 | 0.6741935 |
| 2 | 0.0100000 | 0.9483871 |
| 3 | 0.0150000 | 0.9645161 |
| 4 | 0.0200000 | 0.9870967 |
| 5 | 0.0250000 | 1.0000000 |
| 6 | 0.0300000 | 1.0000000 |
| 7 | 0.0350000 | 1.0000000 |
| 8 | 0.0400000 | 1.0000000 |
| 9 | 0.0450000 | 1.0000000 |
| 10 | 0.0500000 | 1.0000000 |
| 11 | 0.0550000 | 1.0000000 |
| 12 | 0.0600000 | 1.0000000 |
| 13 | 0.0649999 | 1.0000000 |
| 14 | 0.0699999 | 1.0000000 |
| 15 | 0.0749999 | 1.0000000 |
| 16 | 0.0799999 | 1.0000000 |
| 17 | 0.0849999 | 1.0000000 |
| 18 | 0.0899999 | 1.0000000 |
| 19 | 0.0949999 | 1.0000000 |
| 20 | 0.0999999 | 1.0000000 |
| 21 | 0.1049999 | 1.0000000 |
| 22 | 0.1099999 | 1.0000000 |
| 23 | 0.1149999 | 1.0000000 |
| 24 | 0.1199999 | 1.0000000 |
| 25 | 0.1249999 | 1.0000000 |
| 26 | 0.1299999 | 1.0000000 |
| 27 | 0.1349999 | 1.0000000 |
| 28 | 0.1399999 | 1.0000000 |
| 29 | 0.1449999 | 1.0000000 |
| 30 | 0.1499999 | 1.0000000 |
| 31 | 0.1549999 | 1.0000000 |
| 32 | 0.1599998 | 1.0000000 |
| 33 | 0.1649998 | 1.0000000 |
| 34 | 0.1699998 | 1.0000000 |

| | | |
|---|---|---|
| 35 | 0.1749998 | 1.0000000 |
| 36 | 0.1799998 | 1.0000000 |
| 37 | 0.1849998 | 1.0000000 |
| 38 | 0.1899998 | 1.0000000 |
| 39 | 0.1949998 | 1.0000000 |
| 40 | 0.1999998 | 1.0000000 |
| 41 | 0.2049998 | 1.0000000 |
| 42 | 0.2099998 | 1.0000000 |
| 43 | 0.2149998 | 1.0000000 |
| 44 | 0.2199998 | 1.0000000 |
| 45 | 0.2249998 | 1.0000000 |
| 46 | 0.2299998 | 1.0000000 |
| 47 | 0.2349998 | 1.0000000 |
| 48 | 0.2399998 | 1.0000000 |
| 49 | 0.2449998 | 1.0000000 |
| 50 | 0.2499998 | 1.0000000 |
| 51 | 0.2549998 | 1.0000000 |
| 52 | 0.2599998 | 1.0000000 |
| 53 | 0.2649997 | 1.0000000 |
| 54 | 0.2699997 | 1.0000000 |
| 55 | 0.2749997 | 1.0000000 |
| 56 | 0.2799997 | 1.0000000 |
| 57 | 0.2849997 | 1.0000000 |
| 58 | 0.2899997 | 1.0000000 |
| 59 | 0.2949997 | 1.0000000 |
| 60 | 0.2999997 | 1.0000000 |
| 61 | 0.3049997 | 1.0000000 |
| 62 | 0.3099997 | 1.0000000 |
| 63 | 0.3149997 | 1.0000000 |
| 64 | 0.3199997 | 1.0000000 |
| 65 | 0.3249997 | 1.0000000 |
| 66 | 0.3299997 | 1.0000000 |
| 67 | 0.3349997 | 1.0000000 |
| 68 | 0.3399997 | 1.0000000 |
| 69 | 0.3449997 | 1.0000000 |
| 70 | 0.3499997 | 1.0000000 |
| 71 | 0.3549997 | 1.0000000 |
| 72 | 0.3599997 | 1.0000000 |
| 73 | 0.3649997 | 1.0000000 |
| 74 | 0.3699996 | 1.0000000 |
| 75 | 0.3749996 | 1.0000000 |
| 76 | 0.3799996 | 1.0000000 |
| 77 | 0.3849996 | 1.0000000 |
| 78 | 0.3899996 | 1.0000000 |
| 79 | 0.3949996 | 1.0000000 |
| 80 | 0.3999996 | 1.0000000 |
| 81 | 0.4049996 | 1.0000000 |
| 82 | 0.4099996 | 1.0000000 |
| 83 | 0.4149996 | 1.0000000 |
| 84 | 0.4199996 | 1.0000000 |
| 85 | 0.4249996 | 1.0000000 |
| 86 | 0.4299996 | 1.0000000 |
| 87 | 0.4349996 | 1.0000000 |
| 88 | 0.4399996 | 1.0000000 |
| 89 | 0.4449996 | 1.0000000 |
| 90 | 0.4499996 | 1.0000000 |
| 91 | 0.4549996 | 1.0000000 |
| 92 | 0.4599996 | 1.0000000 |
| 93 | 0.4649996 | 1.0000000 |
| 94 | 0.4699996 | 1.0000000 |
| 95 | 0.4749995 | 1.0000000 |
| 96 | 0.4799995 | 1.0000000 |
| 97 | 0.4849995 | 1.0000000 |
| 98 | 0.4899995 | 1.0000000 |
| 99 | 0.4949995 | 1.0000000 |
| 100 | 0.4999995 | 1.0000000 |

SPOT DIAGRAM CALCULATIONS COMPLETE.
TO OBTAIN PLOTS FROM THE PLOTTER OR THE PRINTER,
ISSUE THE FOLLOWING COMMAND:
FOR PRINTER PLOTS ENTER "LENSCOM PRINTER"
FOR PLOTTER GRAPHS ENTER "LENSCOM PLOTTER"
END OF PROGRAM

## RESULTS FROM GRIN

2. Input: $X_C = -0.07$, DIV = $-0.05$, $\alpha_p = 0.0$

GRIA PARAPETERS(2):

ALPHA = 0.7853979 BETA = 0.3227880 RADIUS = 1.00000 INCIDENT ANGLE = 0.0 ITERATIONS = 1000

EDGE THICKNESS = 0.0500000 INDICES OF REFRACTION: N1 = 1.00000 N2 = 1.42157 N3 = 1.00000

FOCAL LENGTH FROM STATION ZERO = 4.00000 DELTA BETA= 0.00032

CENTER OF SYM(XC)=-0.07000 CHANGE IN N2(%)=-0.050 ALFAP= 0.0

NOTE:X-COORDINATES HAS BEEN SHIFTED IN CASE=2 BY X2(K);NOW,X2(K)=0.0 ETC.

| J | X1 | Y1 | X2 | Y2 | BETA | I2P | I2 | ETA | Y | I1P | I1 | DYDXT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | E | THETAE | THETAO | PSI | PSIO | RR | RF | | | | | |
| 1 | 1.0000000 | 1.0000000 | 1.0578299 | 0.9841160 | 0.3227880 | 0.1770834 | 0.1242387 | 0.1457046 | 0.0500000 | 0.5192339 | 0.7853981 | 6.8145685 |
| | 1.7758808 | 0.0341402 | 0.7174545 | 2.1238327 | 2.1541939 | 1.4968252 | 1.4645472 | | | | | |
| 2 | 0.9990332 | 0.9990329 | 1.0576835 | 0.9931174 | 0.3224677 | 0.1763687 | 0.1237326 | 0.1460991 | 0.0607717 | 0.5191766 | 0.7853981 | 6.7958994 |
| | 1.7744253 | 0.0345468 | 0.7170161 | 2.1239070 | 2.1547441 | 1.4960585 | 1.4631805 | | | | | |
| 3 | 0.9982181 | 0.9982177 | 1.0575380 | 0.9921186 | 0.3221475 | 0.1750044 | 0.1227734 | 0.1471431 | 0.0614657 | 0.5191280 | 0.7853981 | 6.7469873 |
| | 1.7732067 | 0.0349594 | 0.7165768 | 2.1237850 | 2.1550980 | 1.4952917 | 1.4620285 | | | | | |
| 4 | 0.9974065 | 0.9974065 | 1.0573902 | 0.9911208 | 0.3218273 | 0.1736302 | 0.1218372 | 0.1481571 | 0.0621548 | 0.5190799 | 0.7853981 | 6.6982575 |
| | 1.7719898 | 0.0353713 | 0.7161383 | 2.1237631 | 2.1554489 | 1.4945250 | 1.4608822 | | | | | |
| 5 | 0.9965956 | 0.9965956 | 1.0572424 | 0.9901232 | 0.3215071 | 0.1722565 | 0.1208414 | 0.1492506 | 0.0628436 | 0.5190316 | 0.7853981 | 6.6503172 |
| | 1.7707726 | 0.0357835 | 0.7156995 | 2.1237421 | 2.1557999 | 1.4937592 | 1.4597359 | | | | | |
| 6 | 0.9957882 | 0.9957879 | 1.0570917 | 0.9791265 | 0.3211868 | 0.1708695 | 0.1198663 | 0.1503173 | 0.0635273 | 0.5189835 | 0.7853981 | 6.6024132 |
| | 1.7695555 | 0.0361545 | 0.7152619 | 2.1237202 | 2.1561460 | 1.4929914 | 1.4585943 | | | | | |
| 7 | 0.9949798 | 0.9949794 | 1.0569401 | 0.9781302 | 0.3208666 | 0.1694861 | 0.1188936 | 0.1513805 | 0.0642104 | 0.5189357 | 0.7853981 | 6.5553312 |
| | 1.7683445 | 0.0366053 | 0.7148244 | 2.1236982 | 2.1564932 | 1.4922237 | 1.4574518 | | | | | |
| 8 | 0.9941674 | 0.9941668 | 1.0567894 | 0.9771340 | 0.3205464 | 0.1681308 | 0.1179406 | 0.1524156 | 0.0648972 | 0.5188876 | 0.7853981 | 6.5101261 |
| | 1.7671223 | 0.0370167 | 0.7143863 | 2.1236762 | 2.1568489 | 1.4914570 | 1.4563026 | | | | | |
| 9 | 0.9933543 | 0.9933545 | 1.0566387 | 0.9761376 | 0.3202262 | 0.1667696 | 0.1169835 | 0.1534566 | 0.0655839 | 0.5188399 | 0.7853981 | 6.4652700 |
| | 1.7658951 | 0.0374287 | 0.7139475 | 2.1236572 | 2.1572037 | 1.4906902 | 1.4551544 | | | | | |
| 10 | 0.9925466 | 0.9925462 | 1.0564880 | 0.9751413 | 0.3199059 | 0.1653891 | 0.1160129 | 0.1545169 | 0.0662678 | 0.5187922 | 0.7853981 | 6.4201975 |
| | 1.7646828 | 0.0378411 | 0.7135084 | 2.1236362 | 2.1575537 | 1.4899244 | 1.4540119 | | | | | |
| 11 | 0.9917382 | 0.9917382 | 1.0563345 | 0.9741465 | 0.3195857 | 0.1640121 | 0.1150448 | 0.1555737 | 0.0669485 | 0.5187445 | 0.7853981 | 6.3758812 |
| | 1.7634678 | 0.0382519 | 0.7130708 | 2.1236153 | 2.1579027 | 1.4891577 | 1.4528704 | | | | | |
| 12 | 0.9909316 | 0.9909306 | 1.0561815 | 0.9731519 | 0.3192655 | 0.1626254 | 0.1140659 | 0.1566401 | 0.0676258 | 0.5186967 | 0.7853981 | 6.3317633 |
| | 1.7622538 | 0.0386639 | 0.7126320 | 2.1235933 | 2.1582499 | 1.4883905 | 1.4517288 | | | | | |
| 13 | 0.9901227 | 0.9901223 | 1.0560246 | 0.9721574 | 0.3189453 | 0.1612610 | 0.1131106 | 0.1576843 | 0.0683066 | 0.5186494 | 0.7853981 | 6.2891397 |
| | 1.7610340 | 0.0390733 | 0.7121957 | 2.1235733 | 2.1586008 | 1.4876223 | 1.4505863 | | | | | |
| 14 | 0.9893122 | 0.9893118 | 1.0558681 | 0.9711635 | 0.3186250 | 0.1598964 | 0.1121511 | 0.1587286 | 0.0689859 | 0.5186017 | 0.7853981 | 6.2470646 |
| | 1.7598124 | 0.0394836 | 0.7117585 | 2.1235533 | 2.1589537 | 1.4868546 | 1.4494411 | | | | | |
| 15 | 0.9885064 | 0.9885060 | 1.0557108 | 0.9701700 | 0.3183048 | 0.1585131 | 0.1111786 | 0.1597918 | 0.0696608 | 0.5185544 | 0.7853981 | 6.2047911 |
| | 1.7585952 | 0.0398937 | 0.7113214 | 2.1235323 | 2.1592999 | 1.4860868 | 1.4483023 | | | | | |
| 16 | 0.9876961 | 0.9876961 | 1.0555525 | 0.9691771 | 0.3179846 | 0.1571518 | 0.1102215 | 0.1608328 | 0.0703377 | 0.5185068 | 0.7853981 | 6.1639338 |
| | 1.7573776 | 0.0403035 | 0.7108846 | 2.1235113 | 2.1596527 | 1.4853182 | 1.4471569 | | | | | |
| 17 | 0.9868857 | 0.9868852 | 1.0553932 | 0.9681843 | 0.3176643 | 0.1557747 | 0.1092533 | 0.1618897 | 0.0710113 | 0.5184594 | 0.7853981 | 6.1229887 |
| | 1.7561607 | 0.0407132 | 0.7104479 | 2.1234903 | 2.1600009 | 1.4845505 | 1.4460173 | | | | | |
| 18 | 0.9860805 | 0.9860801 | 1.0552330 | 0.9671923 | 0.3173441 | 0.1544167 | 0.1082985 | 0.1629274 | 0.0716855 | 0.5184122 | 0.7853981 | 6.0832558 |
| | 1.7549381 | 0.0411226 | 0.7100115 | 2.1234693 | 2.1603546 | 1.4837818 | 1.4448729 | | | | | |
| 19 | 0.9852744 | 0.9852740 | 1.0550728 | 0.9662001 | 0.3170239 | 0.1530398 | 0.1073305 | 0.1639841 | 0.0723576 | 0.5183649 | 0.7853981 | 6.0433941 |
| | 1.7537222 | 0.0415324 | 0.7095745 | 2.1234512 | 2.1607027 | 1.4830141 | 1.4437242 | | | | | |
| 20 | 0.9844711 | 0.9844707 | 1.0549101 | 0.9652088 | 0.3167037 | 0.1516597 | 0.1063603 | 0.1650440 | 0.0730256 | 0.5183181 | 0.7853981 | 6.0038757 |
| | 1.7525082 | 0.0419414 | 0.7091385 | 2.1234312 | 2.1610489 | 1.4822454 | 1.4425983 | | | | | |
| 21 | 0.9836635 | 0.9836635 | 1.0547466 | 0.9642183 | 0.3163834 | 0.1502894 | 0.1054031 | 0.1660851 | 0.0736944 | 0.5182711 | 0.7853981 | 5.9655476 |
| | 1.7512878 | 0.0423466 | 0.7087031 | 2.1234112 | 2.1613998 | 1.4814758 | 1.4414577 | | | | | |
| 22 | 0.9828544 | 0.9828539 | 1.0545835 | 0.9632276 | 0.3160632 | 0.1489440 | 0.1044509 | 0.1671193 | 0.0743657 | 0.5182239 | 0.7853981 | 5.9279413 |
| | 1.7500625 | 0.0427566 | 0.7082669 | 2.1233921 | 2.1617546 | 1.4807172 | 1.4403133 | | | | | |
| 23 | 0.9820492 | 0.9820492 | 1.0544195 | 0.9622371 | 0.3157430 | 0.1475698 | 0.1034849 | 0.1681731 | 0.0750328 | 0.5181770 | 0.7853981 | 5.8900890 |
| | 1.7488476 | 0.0431676 | 0.7078306 | 2.1233721 | 2.1621027 | 1.4799385 | 1.4391766 | | | | | |
| 24 | 0.9812443 | 0.9812439 | 1.0542526 | 0.9612480 | 0.3154228 | 0.1461967 | 0.1025196 | 0.1692261 | 0.0756971 | 0.5181302 | 0.7853981 | 5.8527403 |
| | 1.7476292 | 0.0435750 | 0.7073960 | 2.1233521 | 2.1624499 | 1.4791699 | 1.4380379 | | | | | |
| 25 | 0.9804356 | 0.9804345 | 1.0540848 | 0.9602587 | 0.3151025 | 0.1448418 | 0.1015670 | 0.1702607 | 0.0763623 | 0.5180830 | 0.7853981 | 5.8164797 |
| | 1.7464044 | 0.0439825 | 0.7069612 | 2.1233320 | 2.1627827 | 1.4783983 | 1.4368935 | | | | | |
| 26 | 0.9796304 | 0.9796300 | 1.0539169 | 0.9592700 | 0.3147823 | 0.1434748 | 0.1006061 | 0.1713075 | 0.0770261 | 0.5180366 | 0.7853981 | 5.7802429 |
| | 1.7451859 | 0.0443892 | 0.7065261 | 2.1233130 | 2.1631517 | 1.4776287 | 1.4357567 | | | | | |
| 27 | 0.9788262 | 0.9788257 | 1.0537472 | 0.9582819 | 0.3144621 | 0.1421172 | 0.9996445 | 0.1723548 | 0.0776865 | 0.5179898 | 0.7853981 | 5.7444181 |
| | 1.7439671 | 0.0447971 | 0.7060919 | 2.1232939 | 2.1635008 | 1.4768581 | 1.4346159 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 28 | 0.9780161 | 0.9780157 | 1.0535774 | 0.9572940 | 0.3141419 | 0.1407658 | 0.0987015 | 0.1733760 | 0.0783511 | 0.5175426 | 0.7853981 | 5.7099028 |
| | 1.7427391 | 0.0442043 | 0.7056572 | 2.1232748 | 2.1638545 | 1.4760885 | 1.4334745 | | | | | |
| 29 | 0.9772127 | 0.9772123 | 1.0534048 | 0.9563070 | 0.3138216 | 0.1393892 | 0.0977339 | 0.1744324 | 0.0790080 | 0.5178962 | 0.7853981 | 5.6746187 |
| | 1.7415231 | 0.0456102 | 0.7052239 | 2.1232548 | 2.1642017 | 1.4753170 | 1.4323397 | | | | | |
| 30 | 0.9764978 | 0.9764073 | 1.0532322 | 0.9553211 | 0.3135014 | 0.1380320 | 0.0967798 | 0.1754694 | 0.0796660 | 0.5178498 | 0.7853981 | 5.6403904 |
| | 1.7403021 | 0.0469164 | 0.7047902 | 2.1232357 | 2.1645517 | 1.4745455 | 1.4312019 | | | | | |
| 31 | 0.9756041 | 0.9756037 | 1.0531586 | 0.9543335 | 0.3131812 | 0.1366683 | 0.0958212 | 0.1765129 | 0.0803220 | 0.5178033 | 0.7853981 | 5.6063480 |
| | 1.7390814 | 0.0484225 | 0.7043565 | 2.1232176 | 2.1649008 | 1.4737749 | 1.4300661 | | | | | |
| 32 | 0.9747574 | 0.9747570 | 1.0528860 | 0.9533468 | 0.3128610 | 0.1353173 | 0.0948715 | 0.1775437 | 0.0809811 | 0.5177570 | 0.7853981 | 5.5731106 |
| | 1.7378565 | 0.0498255 | 0.7039220 | 2.1231995 | 2.1652546 | 1.4730043 | 1.4289255 | | | | | |
| 33 | 0.9739921 | 0.9739923 | 1.0527096 | 0.9523613 | 0.3125407 | 0.1339536 | 0.0939130 | 0.1785871 | 0.0816348 | 0.5177106 | 0.7853981 | 5.5398550 |
| | 1.7366362 | 0.0472348 | 0.7034891 | 2.1231794 | 2.1656027 | 1.4722328 | 1.4277887 | | | | | |
| 34 | 0.9731910 | 0.9731906 | 1.0525312 | 0.9513770 | 0.3122205 | 0.1325902 | 0.0929546 | 0.1796303 | 0.0822843 | 0.5176646 | 0.7853981 | 5.5069818 |
| | 1.7354163 | 0.0546388 | 0.7030574 | 2.1231613 | 2.1659489 | 1.4714594 | 1.4266558 | | | | | |
| 35 | 0.9723862 | 0.9723858 | 1.0523539 | 0.9503918 | 0.3119003 | 0.1312360 | 0.0920027 | 0.1806642 | 0.0829370 | 0.5176182 | 0.7853981 | 5.4747763 |
| | 1.7341946 | 0.0480442 | 0.7026244 | 2.1231432 | 2.1662998 | 1.4706869 | 1.4255180 | | | | | |
| 36 | 0.9715816 | 0.9715806 | 1.0521755 | 0.9494074 | 0.3115801 | 0.1298792 | 0.0910490 | 0.1817009 | 0.0835850 | 0.5175719 | 0.7853981 | 5.4428511 |
| | 1.7329721 | 0.0494491 | 0.7021917 | 2.1231241 | 2.1666498 | 1.4699154 | 1.4243803 | | | | | |
| 37 | 0.9707777 | 0.9707774 | 1.0519953 | 0.9484236 | 0.3112598 | 0.1285223 | 0.0900954 | 0.1827375 | 0.0842375 | 0.5175259 | 0.7853981 | 5.4112825 |
| | 1.7317486 | 0.0508533 | 0.7017598 | 2.1231060 | 2.1669989 | 1.4691420 | 1.4232445 | | | | | |
| 38 | 0.9699755 | 0.9699755 | 1.0518141 | 0.9474404 | 0.3109396 | 0.1271593 | 0.0891374 | 0.1837803 | 0.0848841 | 0.5174800 | 0.7853981 | 5.3798809 |
| | 1.7305256 | 0.0522573 | 0.7013280 | 2.1230879 | 2.1673460 | 1.4683695 | 1.4221115 | | | | | |
| 39 | 0.9691684 | 0.9691679 | 1.0516338 | 0.9464566 | 0.3106194 | 0.1258184 | 0.0881950 | 0.1848009 | 0.0855357 | 0.5174336 | 0.7853981 | 5.3494854 |
| | 1.7293015 | 0.0496623 | 0.7008951 | 2.1230688 | 2.1677008 | 1.4675970 | 1.4209700 | | | | | |
| 40 | 0.9680803 | 0.9680803 | 1.0514517 | 0.9454739 | 0.3102992 | 0.1256915 | 0.0881912 | 0.1846077 | 0.0863815 | 0.5173714 | 0.7853981 | 5.3552170 |
| | 1.7276445 | 0.0500532 | 0.7004632 | 2.1231450 | 2.1684198 | 1.4668245 | 1.4194326 | | | | | |
| 41 | 0.9675527 | 0.9675523 | 1.0512695 | 0.9444906 | 0.3099789 | 0.1231464 | 0.0863169 | 0.1868325 | 0.0868351 | 0.5173414 | 0.7853981 | 5.2899637 |
| | 1.7268419 | 0.0504768 | 0.7003305 | 2.1230326 | 2.1686113 | 1.4660511 | 1.4186869 | | | | | |
| 42 | 0.9664838 | 0.9664834 | 1.0510845 | 0.9435091 | 0.3096587 | 0.1229408 | 0.0861683 | 0.1867179 | 0.0876647 | 0.5172803 | 0.7853981 | 5.2932882 |
| | 1.7252131 | 0.0508644 | 0.6995996 | 2.1230087 | 2.1691055 | 1.4652777 | 1.4171762 | | | | | |
| 43 | 0.9659456 | 0.9659454 | 1.0509005 | 0.9425265 | 0.3093385 | 0.1204367 | 0.0844127 | 0.1889018 | 0.0881205 | 0.5172499 | 0.7853981 | 5.2306385 |
| | 1.7243977 | 0.0512781 | 0.6991674 | 2.1229973 | 2.1691393 | 1.4645042 | 1.4164709 | | | | | |
| 44 | 0.9648842 | 0.9648837 | 1.0507145 | 0.9415456 | 0.3090183 | 0.1202155 | 0.0842533 | 0.1888027 | 0.0889467 | 0.5171892 | 0.7853981 | 5.2334480 |
| | 1.7227726 | 0.0516722 | 0.6987360 | 2.1229744 | 2.1697998 | 1.4637338 | 1.4149151 | | | | | |
| 45 | 0.9640616 | 0.9640611 | 1.0505266 | 0.9405650 | 0.3086980 | 0.1189576 | 0.0833690 | 0.1897404 | 0.0896006 | 0.5171425 | 0.7853981 | 5.2069588 |
| | 1.7215176 | 0.0520740 | 0.6983054 | 2.1229563 | 2.1701765 | 1.4629564 | 1.4137526 | | | | | |
| 46 | 0.9632557 | 0.9632553 | 1.0503387 | 0.9395845 | 0.3083778 | 0.1176050 | 0.0824187 | 0.1907728 | 0.0902399 | 0.5170970 | 0.7853981 | 5.1780920 |
| | 1.7202946 | 0.0524769 | 0.6978744 | 2.1229391 | 2.1705256 | 1.4621830 | 1.4126196 | | | | | |
| 47 | 0.9624551 | 0.9624547 | 1.0501509 | 0.9386039 | 0.3080575 | 0.1162421 | 0.0814615 | 0.1918148 | 0.0908784 | 0.5170515 | 0.7853981 | 5.1492643 |
| | 1.7190723 | 0.0528803 | 0.6974429 | 2.1229210 | 2.1708727 | 1.4614077 | 1.4114876 | | | | | |
| 48 | 0.9616554 | 0.9616554 | 1.0499620 | 0.9376236 | 0.3077374 | 0.1148872 | 0.0805092 | 0.1928501 | 0.0915150 | 0.5170061 | 0.7853981 | 5.1209297 |
| | 1.7178507 | 0.0532837 | 0.6970115 | 2.1229038 | 2.1712209 | 1.4606342 | 1.4103575 | | | | | |
| 49 | 0.9608634 | 0.9608631 | 1.0497713 | 0.9366441 | 0.3074171 | 0.1135186 | 0.0795476 | 0.1938985 | 0.0921475 | 0.5169613 | 0.7853981 | 5.0925426 |
| | 1.7166326 | 0.0536862 | 0.6965809 | 2.1228876 | 2.1715651 | 1.4598589 | 1.4092321 | | | | | |
| 50 | 0.9600658 | 0.9600654 | 1.0495826 | 0.9356649 | 0.3070969 | 0.1121524 | 0.0785864 | 0.1949465 | 0.0927808 | 0.5169159 | 0.7853981 | 5.0644665 |
| | 1.7154167 | 0.0540899 | 0.6961499 | 2.1228695 | 2.1719084 | 1.4590845 | 1.4081049 | | | | | |
| 51 | 0.9592710 | 0.9592706 | 1.0493860 | 0.9346868 | 0.3067766 | 0.1107791 | 0.0776231 | 0.1959975 | 0.0934081 | 0.5168712 | 0.7853981 | 5.0366039 |
| | 1.7141991 | 0.0544950 | 0.6957209 | 2.1228533 | 2.1722498 | 1.4583092 | 1.4069815 | | | | | |
| 52 | 0.9584741 | 0.9584737 | 1.0491915 | 0.9337089 | 0.3064564 | 0.1094183 | 0.0766602 | 0.1970482 | 0.0940369 | 0.5168260 | 0.7853981 | 5.0090456 |
| | 1.7129812 | 0.0549012 | 0.6952915 | 2.1228361 | 2.1725922 | 1.4575315 | 1.4059552 | | | | | |
| 53 | 0.9576756 | 0.9576746 | 1.0489960 | 0.9327339 | 0.3061362 | 0.1080561 | 0.0757102 | 0.1980801 | 0.0946662 | 0.5167810 | 0.7853981 | 4.9822626 |
| | 1.7117571 | 0.0553023 | 0.6948615 | 2.1228195 | 2.1729393 | 1.4567556 | 1.4047260 | | | | | |
| 54 | 0.9568785 | 0.9568785 | 1.0488005 | 0.9317538 | 0.3058160 | 0.1066982 | 0.0747565 | 0.1991178 | 0.0952533 | 0.5167364 | 0.7853981 | 4.9556046 |
| | 1.7105376 | 0.0557036 | 0.6944324 | 2.1228037 | 2.1732865 | 1.4559803 | 1.4036007 | | | | | |
| 55 | 0.9560814 | 0.9560810 | 1.0486021 | 0.9307770 | 0.3054957 | 0.1053368 | 0.0733003 | 0.2001589 | 0.0959185 | 0.5166913 | 0.7853981 | 4.9291315 |
| | 1.7093182 | 0.0560529 | 0.6940038 | 2.1227865 | 2.1736288 | 1.4552031 | 1.4024734 | | | | | |
| 56 | 0.9552845 | 0.9552841 | 1.0484029 | 0.9298017 | 0.3051755 | 0.1039761 | 0.0729446 | 0.2011995 | 0.0965423 | 0.5166466 | 0.7853981 | 4.9029436 |
| | 1.7080965 | 0.0564938 | 0.6935756 | 2.1227713 | 2.1739721 | 1.4544249 | 1.4013472 | | | | | |
| 57 | 0.9544875 | 0.9544874 | 1.0482035 | 0.9288244 | 0.3048553 | 0.1026149 | 0.0718886 | 0.2022403 | 0.0971659 | 0.5166020 | 0.7853981 | 4.8770142 |
| | 1.7068758 | 0.0568942 | 0.6931467 | 2.1227541 | 2.1743164 | 1.4536476 | 1.4002219 | | | | | |
| 58 | 0.9536892 | 0.9536887 | 1.0480042 | 0.9278497 | 0.3045351 | 0.1012721 | 0.0709441 | 0.2032650 | 0.0977507 | 0.5165573 | 0.7853981 | 4.8517456 |
| | 1.7056512 | 0.0572947 | 0.6927177 | 2.1227379 | 2.1746645 | 1.4528713 | 1.3991527 | | | | | |
| 59 | 0.9528967 | 0.9528963 | 1.0478025 | 0.9268731 | 0.3042148 | 0.0998933 | 0.0699751 | 0.2043245 | 0.0984084 | 0.5165127 | 0.7853981 | 4.8258753 |
| | 1.7044372 | 0.0576943 | 0.6922897 | 2.1227217 | 2.1749121 | 1.4520931 | 1.3979731 | | | | | |
| 60 | 0.9520988 | 0.9520984 | 1.0475996 | 0.9258996 | 0.3038946 | 0.0985189 | 0.0690033 | 0.2053457 | 0.0990296 | 0.5164680 | 0.7853981 | 4.8011942 |
| | 1.7032108 | 0.0580938 | 0.6918616 | 2.1227064 | 2.1753511 | 1.4513149 | 1.3968449 | | | | | |
| 61 | 0.9513028 | 0.9513024 | 1.0473967 | 0.9249238 | 0.3035744 | 0.0971854 | 0.0680256 | 0.2063850 | 0.0996479 | 0.5164238 | 0.7853981 | 4.7762260 |
| | 1.7019911 | 0.0584933 | 0.6914335 | 2.1226922 | 2.1756915 | 1.4505367 | 1.3957214 | | | | | |
| 62 | 0.9505092 | 0.9505088 | 1.0471926 | 0.9239474 | 0.3032542 | 0.0958159 | 0.0671141 | 0.2074383 | 0.1002650 | 0.5163792 | 0.7853981 | 4.7513638 |
| | 1.7007732 | 0.0588926 | 0.6910056 | 2.1226792 | 2.1760320 | 1.4497585 | 1.3945993 | | | | | |
| 63 | 0.9497162 | 0.9497158 | 1.0469875 | 0.9229755 | 0.3029339 | 0.0944684 | 0.0661678 | 0.2084656 | 0.1008813 | 0.5163350 | 0.7853981 | 4.7272654 |
| | 1.6995451 | 0.0592917 | 0.6905779 | 2.1226587 | 2.1763892 | 1.4489803 | 1.3934746 | | | | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64 | 0.5489155 | 0.9489151 | 1.0467815 | 0.9229018 | 0.3926137 | 0.0931179 | 0.0652196 | 0.2094958 | 0.1014991 | 0.5162903 | 0.7853981 | 4.7033281 |
| | 1.6983242 | 0.0556507 | 0.6901501 | 2.1226425 | 2.1767263 | 1.4482012 | 1.3523464 | | | | | |
| 65 | 0.5481268 | 0.9481259 | 1.0465746 | 0.9210287 | 0.3922995 | 0.0917481 | 0.0642587 | 0.2105514 | 0.1021093 | 0.5162466 | 0.7853981 | 4.6790419 |
| | 1.6971105 | 0.0600854 | 0.6897228 | 2.1226273 | 2.1770639 | 1.4474220 | 1.3512306 | | | | | |
| 66 | 0.5473266 | 0.9473256 | 1.0463667 | 0.9200556 | 0.3919709 | 0.0904114 | 0.0633194 | 0.2115619 | 0.1027264 | 0.5162019 | 0.7853981 | 4.6560173 |
| | 1.6958605 | 0.0644882 | 0.6892952 | 2.1226110 | 2.1774149 | 1.4466429 | 1.3500995 | | | | | |
| 67 | 0.5465327 | 0.9465322 | 1.0461157 | 0.9190831 | 0.3916530 | 0.0890550 | 0.0623673 | 0.2125980 | 0.1033375 | 0.5161581 | 0.7853981 | 4.6326323 |
| | 1.6946588 | 0.0690865 | 0.6888680 | 2.1225967 | 2.1777502 | 1.4458628 | 1.3489780 | | | | | |
| 68 | 0.5457378 | 0.9457368 | 1.0459480 | 0.9181111 | 0.3913328 | 0.0877154 | 0.0614199 | 0.2136274 | 0.1039489 | 0.5161139 | 0.7853981 | 4.6098210 |
| | 1.6934336 | 0.0737846 | 0.6884410 | 2.1225815 | 2.1781034 | 1.4450836 | 1.3478536 | | | | | |
| 69 | 0.5449402 | 0.9449419 | 1.0457382 | 0.9171388 | 0.3910126 | 0.0863495 | 0.0604681 | 0.2146631 | 0.1045601 | 0.5160697 | 0.7853981 | 4.5866880 |
| | 1.6922121 | 0.0786532 | 0.6880135 | 2.1225662 | 2.1784468 | 1.4443035 | 1.3467311 | | | | | |
| 70 | 0.5441494 | 0.9441450 | 1.0455265 | 0.9161675 | 0.3906924 | 0.0849995 | 0.0595267 | 0.2156925 | 0.1051678 | 0.5160260 | 0.7853981 | 4.5641079 |
| | 1.6909954 | 0.0836809 | 0.6875869 | 2.1225510 | 2.1787910 | 1.4435244 | 1.3456096 | | | | | |
| 71 | 0.9433848 | 0.9433483 | 1.0453157 | 0.9151957 | 0.3903721 | 0.0836700 | 0.0585874 | 0.2167021 | 0.1057820 | 0.5159818 | 0.7853981 | 4.5421686 |
| | 1.6897564 | 0.0887797 | 0.6871590 | 2.1225367 | 2.1791430 | 1.4427443 | 1.3444786 | | | | | |
| 72 | 0.9425616 | 0.9425612 | 1.0451012 | 0.9142255 | 0.3900519 | 0.0822957 | 0.0576229 | 0.2177563 | 0.1063827 | 0.5159383 | 0.7853981 | 4.5194731 |
| | 1.6885432 | 0.0940765 | 0.6867388 | 2.1225214 | 2.1794786 | 1.4419632 | 1.3433656 | | | | | |
| 73 | 0.9417635 | 0.9417630 | 1.0448866 | 0.9132547 | 0.3897317 | 0.0809627 | 0.0566875 | 0.2187650 | 0.1069911 | 0.5158942 | 0.7853981 | 4.4978782 |
| | 1.6873128 | 0.0993728 | 0.6863068 | 2.1225071 | 2.1798206 | 1.4411821 | 1.3422374 | | | | | |
| 74 | 0.9409728 | 0.9409719 | 1.0446701 | 0.9122852 | 0.3894115 | 0.0795081 | 0.0557299 | 0.2198193 | 0.1075976 | 0.5158504 | 0.7853981 | 4.4758053 |
| | 1.6860532 | 0.1046103 | 0.6858814 | 2.1224918 | 2.1801672 | 1.4404001 | 1.3411197 | | | | | |
| 75 | 0.9401742 | 0.9401738 | 1.0444546 | 0.9113150 | 0.3890912 | 0.0782717 | 0.0547691 | 0.2208195 | 0.1081999 | 0.5158067 | 0.7853981 | 4.4547396 |
| | 1.6847612 | 0.1098676 | 0.6854547 | 2.1224775 | 2.1805182 | 1.4396191 | 1.3399515 | | | | | |
| 76 | 0.9393756 | 0.9393754 | 1.0442381 | 0.9103455 | 0.3887710 | 0.0769269 | 0.0538555 | 0.2218441 | 0.1088036 | 0.5157629 | 0.7853981 | 4.4334774 |
| | 1.6834367 | 0.1151449 | 0.6850283 | 2.1224633 | 2.1808634 | 1.4388380 | 1.3388691 | | | | | |
| 77 | 0.9385775 | 0.9385771 | 1.0440197 | 0.9093766 | 0.3884508 | 0.0755754 | 0.0529512 | 0.2228754 | 0.1094038 | 0.5157195 | 0.7853981 | 4.4122725 |
| | 1.6820711 | 0.1204814 | 0.6845976 | 2.1224485 | 2.1812067 | 1.4380560 | 1.3377494 | | | | | |
| 78 | 0.9377788 | 0.9377784 | 1.0438014 | 0.9084081 | 0.3881306 | 0.0742088 | 0.0519485 | 0.2239218 | 0.1099996 | 0.5156758 | 0.7853981 | 4.3909540 |
| | 1.6806622 | 0.1258272 | 0.6841776 | 2.1224346 | 2.1815494 | 1.4372739 | 1.3366346 | | | | | |
| 79 | 0.9370026 | 0.9370021 | 1.0435791 | 0.9074396 | 0.3878103 | 0.0728735 | 0.0510117 | 0.2249368 | 0.1106007 | 0.5156325 | 0.7853981 | 4.3704615 |
| | 1.6792065 | 0.1312520 | 0.6837520 | 2.1224194 | 2.1818914 | 1.4364901 | 1.3355053 | | | | | |
| 80 | 0.9362255 | 0.9362254 | 1.0433565 | 0.9064721 | 0.3874901 | 0.0715325 | 0.0500710 | 0.2259576 | 0.1111971 | 0.5155891 | 0.7853981 | 4.3500309 |
| | 1.6778138 | 0.1366487 | 0.6833274 | 2.1224060 | 2.1822357 | 1.4357071 | 1.3343687 | | | | | |
| 81 | 0.9354488 | 0.9354481 | 1.0431428 | 0.9055051 | 0.3871699 | 0.0701756 | 0.0491192 | 0.2269943 | 0.1117907 | 0.5155457 | 0.7853981 | 4.3294716 |
| | 1.6763916 | 0.1420433 | 0.6829033 | 2.1223917 | 2.1825743 | 1.4349222 | 1.3332700 | | | | | |
| 82 | 0.9346755 | 0.9346755 | 1.0429287 | 0.9045382 | 0.3868497 | 0.0688347 | 0.0481787 | 0.2280149 | 0.1123850 | 0.5155025 | 0.7853981 | 4.3094082 |
| | 1.6749426 | 0.1474116 | 0.6824790 | 2.1223783 | 2.1829185 | 1.4341383 | 1.3321504 | | | | | |
| 83 | 0.9339055 | 0.9339026 | 1.0427146 | 0.9035711 | 0.3865294 | 0.0675102 | 0.0472497 | 0.2290152 | 0.1129825 | 0.5154588 | 0.7853981 | 4.2898378 |
| | 1.6734668 | 0.1527533 | 0.6820540 | 2.1223640 | 2.1832605 | 1.4333553 | 1.3310241 | | | | | |
| 84 | 0.9331382 | 0.9331378 | 1.0424985 | 0.9026047 | 0.3862092 | 0.0661636 | 0.0463054 | 0.2300456 | 0.1135737 | 0.5154158 | 0.7853981 | 4.2700100 |
| | 1.6719632 | 0.1580768 | 0.6816298 | 2.1223507 | 2.1836009 | 1.4325705 | 1.3298864 | | | | | |
| 85 | 0.9323747 | 0.9323746 | 1.0422806 | 0.9016390 | 0.3858890 | 0.0648138 | 0.0453588 | 0.2310752 | 0.1141631 | 0.5153726 | 0.7853981 | 4.2502556 |
| | 1.6704324 | 0.1633822 | 0.6812063 | 2.1223373 | 2.1839414 | 1.4317846 | 1.3287378 | | | | | |
| 86 | 0.9316152 | 0.9316118 | 1.0420636 | 0.9006730 | 0.3855688 | 0.0634867 | 0.0444082 | 0.2320821 | 0.1147560 | 0.5153296 | 0.7853981 | 4.2311802 |
| | 1.6688744 | 0.1686691 | 0.6807818 | 2.1223240 | 2.1842795 | 1.4310007 | 1.3275653 | | | | | |
| 87 | 0.9308595 | 0.9308591 | 1.0417757 | 0.8997075 | 0.3852485 | 0.0621470 | 0.0434889 | 0.2331015 | 0.1153464 | 0.5152863 | 0.7853981 | 4.2119932 |
| | 1.6673488 | 0.1739117 | 0.6803575 | 2.1223097 | 2.1846437 | 1.4302158 | 1.3263447 | | | | | |
| 88 | 0.9301070 | 0.9301061 | 1.0415440 | 0.8987431 | 0.3849283 | 0.0607920 | 0.0425389 | 0.2341363 | 0.1159304 | 0.5152434 | 0.7853981 | 4.1926823 |
| | 1.6658262 | 0.1791546 | 0.6799350 | 2.1222963 | 2.1849813 | 1.4294291 | 1.3254759 | | | | | |
| 89 | 0.9293595 | 0.9293551 | 1.0413122 | 0.8977786 | 0.3846081 | 0.0594493 | 0.0415975 | 0.2351588 | 0.1165156 | 0.5152006 | 0.7853981 | 4.1737680 |
| | 1.6643100 | 0.1843978 | 0.6795126 | 2.1222830 | 2.1853237 | 1.4286432 | 1.3243122 | | | | | |
| 90 | 0.9286156 | 0.9286154 | 1.0410824 | 0.8968138 | 0.3842879 | 0.0581204 | 0.0406660 | 0.2361675 | 0.1170948 | 0.5151576 | 0.7853981 | 4.1552658 |
| | 1.6627967 | 0.1896523 | 0.6790876 | 2.1222706 | 2.1856709 | 1.4278574 | 1.3231897 | | | | | |
| 91 | 0.9278758 | 0.9278754 | 1.0408506 | 0.8958492 | 0.3839676 | 0.0568002 | 0.0397405 | 0.2371674 | 0.1176922 | 0.5151148 | 0.7853981 | 4.1370773 |
| | 1.6612886 | 0.1948903 | 0.6786637 | 2.1222582 | 2.1860199 | 1.4270716 | 1.3220672 | | | | | |
| 92 | 0.9271422 | 0.9271418 | 1.0406170 | 0.8948858 | 0.3836474 | 0.0554492 | 0.0387936 | 0.2381982 | 0.1182744 | 0.5150719 | 0.7853981 | 4.1194816 |
| | 1.6597810 | 0.2001196 | 0.6782407 | 2.1222448 | 2.1863594 | 1.4262848 | 1.3209514 | | | | | |
| 93 | 0.9264146 | 0.9264143 | 1.0403843 | 0.8939217 | 0.3833272 | 0.0541218 | 0.0378737 | 0.2392463 | 0.1188440 | 0.5150148 | 0.7853981 | 4.1212120 |
| | 1.6582367 | 0.2053711 | 0.6778165 | 2.1222277 | 2.1870546 | 1.4254990 | 1.3194577 | | | | | |
| 94 | 0.9256866 | 0.9256861 | 1.0401506 | 0.8929593 | 0.3830070 | 0.0529219 | 0.0370222 | 0.2400851 | 0.1194652 | 0.5145847 | 0.7853981 | 4.0848522 |
| | 1.6567305 | 0.2106165 | 0.6773926 | 2.1222181 | 2.1870918 | 1.4247131 | 1.3186683 | | | | | |
| 95 | 0.9249584 | 0.9249581 | 1.0399151 | 0.8919951 | 0.3826867 | 0.0525130 | 0.0367362 | 0.2401737 | 0.1201933 | 0.5149305 | 0.7853981 | 4.0832863 |
| | 1.6552944 | 0.2158191E | 0.6769692 | 2.1222019 | 2.1877146 | 1.4239264 | 1.3172521 | | | | | |
| 96 | 0.9235056 | 0.9235054 | 1.0396795 | 0.8910323 | 0.3823665 | 0.0502401 | 0.0351439 | 0.2421264 | 0.1206262 | 0.5148997 | 0.7853981 | 4.0490475 |
| | 1.6538452 | 0.2210535 | 0.6765455 | 2.1221933 | 2.1877766 | 1.4231386 | 1.3564358 | | | | | |
| 97 | 0.9225228 | 0.9225278 | 1.0394421 | 0.8900697 | 0.3820462 | 0.0489332 | 0.0347845 | 0.2423161 | 0.1213357 | 0.5148471 | 0.7853981 | 4.0457516 |
| | 1.6523241 | 0.2262955 | 0.6761224 | 2.1221781 | 2.1883688 | 1.4223518 | 1.3550529 | | | | | |
| 98 | 0.9216946 | 0.9216944 | 1.0392036 | 0.8891079 | 0.3817261 | 0.0476927 | 0.0339872 | 1.2431334 | 0.1219434 | 0.5148025 | 0.7853981 | 4.0316029 |
| | 1.6508262 | 0.2314704 | 0.6756995 | 2.1221657 | 2.1887712 | 1.4215641 | 1.3538752 | | | | | |
| 99 | 0.9208945 | 0.9208944 | 1.0389652 | 0.8881457 | 0.3814058 | 0.0472969 | 0.0330794 | 0.2441089 | 0.1225279 | 0.5147592 | 0.7853981 | 4.0148382 |
| | 1.6493826 | 0.2366233 | 0.6752762 | 2.1221533 | 2.1891271 | 1.4207764 | 1.3527441 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 0.9201262 | 0.9201262 | 1.0387239 | 0.8871847 | 0.2910856 | 0.0458653 | 0.0320767 | 0.2457203 | 0.1230872 | 0.5147179 | 0.7853981 | 3.9958963 |
| | 1.6537876 | 0.0739159 | 0.6740541 | 2.1221409 | 2.1894407 | 1.4199877 | 1.3516589 | | | | | |
| 101 | 0.9193512 | 0.9153568 | 1.0384817 | 0.8862239 | 0.2907653 | 0.0444432 | 0.0310008 | 0.2463221 | 0.1236464 | 0.5146770 | 0.7853981 | 3.9772835 |
| | 1.6525488 | 0.0743083 | 0.6744322 | 2.1221294 | 2.1897564 | 1.4191980 | 1.3505716 | | | | | |
| 102 | 0.9185726 | 0.9185722 | 1.0382414 | 0.8852626 | 0.2904451 | 0.0430882 | 0.0301318 | 0.2473570 | 0.1242181 | 0.5146350 | 0.7853981 | 3.9599495 |
| | 1.6513612 | 0.0747018 | 0.6749085 | 2.1221177 | 2.1900943 | 1.4184123 | 1.3494625 | | | | | |
| 103 | 0.9178134 | 0.9178130 | 1.0379972 | 0.8843022 | 0.2901249 | 0.0416190 | 0.0291030 | 0.2485059 | 0.1247683 | 0.5145944 | 0.7853981 | 3.9408712 |
| | 1.6501637 | 0.0750543 | 0.6753868 | 2.1221066 | 2.1903963 | 1.4176197 | 1.3483896 | | | | | |
| 104 | 0.9170303 | 0.9170378 | 1.0377541 | 0.8833421 | 0.2898047 | 0.0402265 | 0.0281280 | 0.2495782 | 0.1253304 | 0.5145531 | 0.7853981 | 3.9232197 |
| | 1.6489733 | 0.0754071 | 0.6758642 | 2.1220951 | 2.1907215 | 1.4168310 | 1.3472939 | | | | | |
| 105 | 0.9162696 | 0.9162686 | 1.0375090 | 0.8823820 | 0.2894844 | 0.0388791 | 0.0271357 | 0.2506754 | 0.1258866 | 0.5145122 | 0.7853981 | 3.9053125 |
| | 1.6477737 | 0.0757596 | 0.6763415 | 2.1220837 | 2.1910381 | 1.4160414 | 1.3462067 | | | | | |
| 106 | 0.9155056 | 0.9155052 | 1.0372620 | 0.8814227 | 0.2891642 | 0.0373598 | 0.0261211 | 0.2518044 | 0.1264367 | 0.5144713 | 0.7853981 | 3.8870440 |
| | 1.6465845 | 0.0761115 | 0.6768206 | 2.1220722 | 2.1913452 | 1.4152498 | 1.3451281 | | | | | |
| 107 | 0.9147275 | 0.9147275 | 1.0370155 | 0.8804633 | 0.2888440 | 0.0359806 | 0.0251555 | 0.2528634 | 0.1269976 | 0.5144300 | 0.7853981 | 3.8700542 |
| | 1.6453965 | 0.0764637 | 0.6772982 | 2.1220617 | 2.1916742 | 1.4144602 | 1.3440254 | | | | | |
| 108 | 0.9137573 | 0.9137568 | 1.0367679 | 0.8795047 | 0.2885238 | 0.0354479 | 0.0247819 | 0.2530759 | 0.1276895 | 0.5143782 | 0.7853981 | 3.8666630 |
| | 1.6439566 | 0.0770470 | 0.6779772 | 2.1220465 | 2.1922569 | 1.4136686 | 1.3426571 | | | | | |
| 109 | 0.9131062 | 0.9131058 | 1.0365210 | 0.8785453 | 0.2882035 | 0.0335116 | 0.0234271 | 0.2546920 | 0.1281625 | 0.5143438 | 0.7853981 | 3.8410444 |
| | 1.6428388 | 0.0774451 | 0.6710535 | 2.1220319 | 2.1924191 | 1.4128790 | 1.3417368 | | | | | |
| 110 | 0.9122678 | 0.9122674 | 1.0362682 | 0.8775877 | 0.2878833 | 0.0324088 | 0.0226551 | 0.2554745 | 0.1287586 | 0.5142996 | 0.7853981 | 3.8287544 |
| | 1.6415281 | 0.0778323 | 0.6786340 | 2.1220264 | 2.1929202 | 1.4120865 | 1.3405523 | | | | | |
| 111 | 0.9114611 | 0.9114611 | 1.0360165 | 0.8766301 | 0.2875631 | 0.0311574 | 0.0217792 | 0.2564057 | 0.1293334 | 0.5142568 | 0.7853981 | 3.8142233 |
| | 1.6402669 | 0.0782215 | 0.6702134 | 2.1220150 | 2.1931934 | 1.4112940 | 1.3394127 | | | | | |
| 112 | 0.9106844 | 0.9106844 | 1.0357647 | 0.8756724 | 0.2872429 | 0.0297768 | 0.0208132 | 0.2574661 | 0.1298877 | 0.5142156 | 0.7853981 | 3.7978010 |
| | 1.6390543 | 0.0786126 | 0.6697921 | 2.1220045 | 2.1935205 | 1.4105024 | 1.3383159 | | | | | |
| 113 | 0.9059355 | 0.9059395 | 1.0355139 | 0.8747144 | 0.2869226 | 0.0282567 | 0.0197497 | 0.2586660 | 0.1304209 | 0.5141763 | 0.7853981 | 3.7793798 |
| | 1.6378906 | 0.0790056 | 0.6693689 | 2.1219931 | 2.1938057 | 1.4097109 | 1.3372622 | | | | | |
| 114 | 0.9093030 | 0.9093026 | 1.0352583 | 0.8737570 | 0.2866024 | 0.0262651 | 0.0183568 | 0.2603374 | 0.1308746 | 0.5141426 | 0.7853981 | 3.7539559 |
| | 1.6368542 | 0.0794506 | 0.6689499 | 2.1219854 | 2.1939478 | 1.4089174 | 1.3363628 | | | | | |
| 115 | 0.9086926 | 0.9086924 | 1.0350037 | 0.8729010 | 0.2862822 | 0.0241569 | 0.0168826 | 0.2621253 | 0.1313111 | 0.5141107 | 0.7853981 | 3.7271910 |
| | 1.6359367 | 0.0797976 | 0.6685290 | 2.1219778 | 2.1940546 | 1.4081240 | 1.3354998 | | | | | |
| 116 | 0.9078543 | 0.9078539 | 1.0347471 | 0.8718448 | 0.2859620 | 0.0234464 | 0.0161057 | 0.2629156 | 0.1319031 | 0.5140661 | 0.7853981 | 3.7154560 |
| | 1.6346264 | 0.0801849 | 0.6681088 | 2.1219654 | 2.1944618 | 1.4073296 | 1.3343143 | | | | | |
| 117 | 0.9070651 | 0.9070647 | 1.0344887 | 0.8708891 | 0.2856417 | 0.0217270 | 0.0151829 | 0.2639147 | 0.1324592 | 0.5140246 | 0.7853981 | 3.7007198 |
| | 1.6333914 | 0.0805734 | 0.6676893 | 2.1219549 | 2.1948051 | 1.4065351 | 1.3331995 | | | | | |
| 118 | 0.9062825 | 0.9062821 | 1.0342312 | 0.8699332 | 0.2853215 | 0.0203894 | 0.0142415 | 0.2649321 | 0.1330116 | 0.5139837 | 0.7853981 | 3.6858244 |
| | 1.6321646 | 0.0809630 | 0.6672688 | 2.1219454 | 2.1951437 | 1.4057417 | 1.3320932 | | | | | |
| 119 | 0.9055011 | 0.9055007 | 1.0339737 | 0.8689774 | 0.2850013 | 0.0190327 | 0.0132987 | 0.2659686 | 0.1335633 | 0.5139426 | 0.7853981 | 3.6707659 |
| | 1.6309414 | 0.0813532 | 0.6668477 | 2.1219339 | 2.1954765 | 1.4049473 | 1.3309889 | | | | | |
| 120 | 0.9047316 | 0.9047312 | 1.0337152 | 0.8680218 | 0.2846811 | 0.0176321 | 0.0123194 | 0.2670490 | 0.1341058 | 0.5139021 | 0.7853981 | 3.6551886 |
| | 1.6297356 | 0.0817436 | 0.6664268 | 2.1219244 | 2.1957960 | 1.4041538 | 1.3299017 | | | | | |
| 121 | 0.9039711 | 0.9039711 | 1.0334535 | 0.8670670 | 0.2843609 | 0.0161908 | 0.0113118 | 0.2681701 | 0.1346388 | 0.5138626 | 0.7853981 | 3.6391554 |
| | 1.6285429 | 0.0821332 | 0.6660072 | 2.1219149 | 2.1961021 | 1.4033585 | 1.3288279 | | | | | |
| 122 | 0.9032006 | 0.9032002 | 1.0331926 | 0.8661125 | 0.2840406 | 0.0147941 | 0.0103355 | 0.2692465 | 0.1351752 | 0.5138221 | 0.7853981 | 3.6238832 |
| | 1.6273336 | 0.0825227 | 0.6655871 | 2.1219053 | 2.1964226 | 1.4025631 | 1.3277374 | | | | | |
| 123 | 0.9024363 | 0.9024358 | 1.0329294 | 0.8651581 | 0.2837204 | 0.0133690 | 0.0093393 | 0.2703514 | 0.1357133 | 0.5137820 | 0.7853981 | 3.6083298 |
| | 1.6261344 | 0.0829118 | 0.6651675 | 2.1218958 | 2.1967335 | 1.4017668 | 1.3266582 | | | | | |
| 124 | 0.9016665 | 0.9016655 | 1.0326662 | 0.8642043 | 0.2834002 | 0.0119739 | 0.0083637 | 0.2714272 | 0.1362511 | 0.5137417 | 0.7853981 | 3.5933056 |
| | 1.6249275 | 0.0833010 | 0.6647477 | 2.1218863 | 2.1970530 | 1.4009714 | 1.3255701 | | | | | |
| 125 | 0.9008947 | 0.9008940 | 1.0324020 | 0.8632503 | 0.2831799 | 0.0105931 | 0.0073994 | 0.2724969 | 0.1367893 | 0.5137016 | 0.7853981 | 3.5786190 |
| | 1.6237138 | 0.0836902 | 0.6643278 | 2.1218767 | 2.1973772 | 1.4001751 | 1.3244791 | | | | | |
| 126 | 0.8998746 | 0.8998742 | 1.0321369 | 0.8622966 | 0.2827597 | 0.0103145 | 0.0071574 | 0.2724552 | 0.1374568 | 0.5136485 | 0.7853981 | 3.5790567 |
| | 1.6221123 | 0.0842659 | 0.6639082 | 2.1218643 | 2.1981315 | 1.3993788 | 1.3229381 | | | | | |
| 127 | 0.8992694 | 0.8992690 | 1.0318708 | 0.8613431 | 0.2824395 | 0.0081726 | 0.0057089 | 0.2742669 | 0.1379185 | 0.5136167 | 0.7853981 | 3.5541983 |
| | 1.6211634 | 0.0846647 | 0.6634884 | 2.1218567 | 2.1981277 | 1.3985815 | 1.3221827 | | | | | |
| 128 | 0.8982903 | 0.8982859 | 1.0316038 | 0.8603593 | 0.2821193 | 0.0077104 | 0.0053840 | 0.2744089 | 0.1385961 | 0.5135659 | 0.7853981 | 3.5522642 |
| | 1.6196241 | 0.0848446 | 0.6630691 | 2.1218443 | 2.1987286 | 1.3977842 | 1.3207999 | | | | | |
| 129 | 0.8977175 | 0.8977171 | 1.0311358 | 0.8594373 | 0.2817990 | 0.0054466 | 0.0038037 | 0.2763524 | 0.1389535 | 0.5135360 | 0.7853981 | 3.5259781 |
| | 1.6187225 | 0.0852413 | 0.6626496 | 2.1218286 | 2.1987858 | 1.3969870 | 1.3199892 | | | | | |
| 130 | 0.8967162 | 0.8967158 | 1.0310678 | 0.8584846 | 0.2814788 | 0.0050861 | 0.0035517 | 0.2763928 | 0.1396853 | 0.5134841 | 0.7853981 | 3.5254354 |
| | 1.6171414 | 0.0856209 | 0.6622297 | 2.1218271 | 2.1994171 | 1.3961897 | 1.3185740 | | | | | |
| 131 | 0.8958985 | 0.8958985 | 1.0307895 | 0.8575318 | 0.2811586 | 0.0038909 | 0.0027243 | 0.2772576 | 0.1402507 | 0.5134419 | 0.7853981 | 3.5138559 |
| | 1.6158626 | 0.0860083 | 0.6618093 | 2.1218166 | 2.1998005 | 1.3953924 | 1.3174191 | | | | | |
| 132 | 0.8951385 | 0.8951385 | 1.0305300 | 0.8565757 | 0.2808384 | 0.0026421 | 0.0018169 | 0.2782363 | 0.1407954 | 0.5134008 | 0.7853981 | 3.5008392 |
| | 1.6146193 | 0.0863961 | 0.6613896 | 2.1218091 | 2.2001486 | 1.3945942 | 1.3163223 | | | | | |
| 133 | 0.8943216 | 0.8943211 | 1.0302591 | 0.8556277 | 0.2805181 | 0.0012878 | 0.0008991 | 0.2792303 | 0.1413372 | 0.5133601 | 0.7853981 | 3.4877090 |
| | 1.6133804 | 0.0867838 | 0.6609700 | 2.1217995 | 2.2004919 | 1.3937960 | 1.3151903 | | | | | |
| 134 | 0.8935304 | 0.8935300 | 1.0299883 | 0.8546759 | 0.2801979 | -0.0001035 | -0.0000717 | 0.2801554 | 0.1418816 | 0.5133154 | 0.7853981 | 3.4750462 |
| | 1.6121321 | 0.0871719 | 0.6605495 | 2.1217919 | 2.2008444 | 1.3929987 | 1.3140717 | | | | | |
| 135 | 0.8927457 | 0.8927453 | 1.0297155 | 0.8537245 | 0.2798777 | -0.0015237 | -0.0010941 | 0.2812014 | 0.1424196 | 0.5132787 | 0.7853981 | 3.4619389 |
| | 1.6108956 | 0.0875594 | 0.6601306 | 2.1217813 | 2.2011833 | 1.3921995 | 1.3129635 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 136 | 0.8919575 | 0.8919575 | 1.0294418 | 0.8527736 | 0.2795575 | -0.0026274 | -0.0018342 | 0.2821849 | 0.1429598 | 0.5132380 | 0.7853981 | 3.4492111 |
| | 1.6096554 | 0.0879467 | 0.6597113 | 2.1217737 | 2.2015295 | 1.3513994 | 1.3118496 | | | | | |
| 137 | 0.8911651 | 0.8911687 | 1.0291672 | 0.8518228 | 0.2792372 | -0.0039307 | -0.0027428 | 0.2831680 | 0.1434976 | 0.5131974 | 0.7853981 | 3.4365749 |
| | 1.6084131 | 0.0883337 | 0.6592922 | 2.1217642 | 2.2018757 | 1.3506002 | 1.3107347 | | | | | |
| 138 | 0.8903787 | 0.8903782 | 1.0288916 | 0.8508723 | 0.2789170 | -0.0052177 | -0.0036420 | 0.2841347 | 0.1440366 | 0.5131571 | 0.7853981 | 3.4242315 |
| | 1.6071663 | 0.0887207 | 0.6588730 | 2.1217566 | 2.2022257 | 1.3498101 | 1.3096180 | | | | | |
| 139 | 0.8895918 | 0.8895913 | 1.0286150 | 0.8499215 | 0.2785968 | -0.0065303 | -0.0045580 | 0.2851271 | 0.1445722 | 0.5131164 | 0.7853981 | 3.4116459 |
| | 1.6059256 | 0.0891076 | 0.6584539 | 2.1217480 | 2.2025690 | 1.3489999 | 1.3085060 | | | | | |
| 140 | 0.8888061 | 0.8888057 | 1.0283365 | 0.8489724 | 0.2782766 | -0.0078357 | -0.0054688 | 0.2861122 | 0.1451049 | 0.5130761 | 0.7853981 | 3.3992357 |
| | 1.6046848 | 0.0894936 | 0.6580357 | 2.1217403 | 2.2029123 | 1.3481989 | 1.3073959 | | | | | |
| 141 | 0.8880174 | 0.8880169 | 1.0280581 | 0.8480226 | 0.2779563 | -0.0091380 | -0.0063775 | 0.2870944 | 0.1456358 | 0.5130354 | 0.7853981 | 3.3869467 |
| | 1.6034422 | 0.0898803 | 0.6576167 | 2.1217308 | 2.2032576 | 1.3473978 | 1.3062811 | | | | | |
| 142 | 0.8872300 | 0.8872296 | 1.0277786 | 0.8470732 | 0.2776361 | -0.0104393 | -0.0072851 | 0.2880754 | 0.1461727 | 0.5129951 | 0.7853981 | 3.3747520 |
| | 1.6021988 | 0.0902666 | 0.6571981 | 2.1217232 | 2.2036028 | 1.3465967 | 1.3051682 | | | | | |
| 143 | 0.8864405 | 0.8864405 | 1.0274982 | 0.8461241 | 0.2773159 | -0.0117248 | -0.0081816 | 0.2890406 | 0.1467057 | 0.5129549 | 0.7853981 | 3.3628330 |
| | 1.6009512 | 0.0906528 | 0.6567795 | 2.1217155 | 2.2039528 | 1.3457946 | 1.3040533 | | | | | |
| 144 | 0.8856553 | 0.8856549 | 1.0272160 | 0.8451755 | 0.2769957 | -0.0130384 | -0.0090978 | 0.2900341 | 0.1472344 | 0.5129147 | 0.7853981 | 3.3506460 |
| | 1.5997100 | 0.0910385 | 0.6563614 | 2.1217079 | 2.2042942 | 1.3449916 | 1.3029432 | | | | | |
| 145 | 0.8848685 | 0.8848684 | 1.0269327 | 0.8442270 | 0.2766754 | -0.0143360 | -0.0100027 | 0.2910115 | 0.1477629 | 0.5128747 | 0.7853981 | 3.3387337 |
| | 1.5984655 | 0.0914240 | 0.6559435 | 2.1217003 | 2.2046394 | 1.3441887 | 1.3018312 | | | | | |
| 146 | 0.8840794 | 0.8840790 | 1.0266495 | 0.8432782 | 0.2763551 | -0.0156298 | -0.0109047 | 0.2919850 | 0.1482934 | 0.5128345 | 0.7853981 | 3.3269472 |
| | 1.5972185 | 0.0918099 | 0.6555248 | 2.1216927 | 2.2049866 | 1.3433857 | 1.3007164 | | | | | |
| 147 | 0.8832890 | 0.8832886 | 1.0263662 | 0.8423302 | 0.2760350 | -0.0169075 | -0.0117954 | 0.2929424 | 0.1488243 | 0.5127943 | 0.7853981 | 3.3154297 |
| | 1.5959673 | 0.0921959 | 0.6551061 | 2.1216850 | 2.2053385 | 1.3425836 | 1.2995987 | | | | | |
| 148 | 0.8825014 | 0.8825009 | 1.0260811 | 0.8413820 | 0.2757147 | -0.0181742 | -0.0126754 | 0.2938788 | 0.1493516 | 0.5127541 | 0.7853981 | 3.3037577 |
| | 1.5947218 | 0.0925817 | 0.6546877 | 2.1216774 | 2.2056847 | 1.3417797 | 1.2984858 | | | | | |
| 145 | 0.8817161 | 0.8817161 | 1.0257950 | 0.8404346 | 0.2753945 | -0.0194293 | -0.0136180 | 0.2949038 | 0.1498758 | 0.5127142 | 0.7853981 | 3.2920599 |
| | 1.5934801 | 0.0929672 | 0.6542696 | 2.1216698 | 2.2060270 | 1.3409757 | 1.2973766 | | | | | |
| 150 | 0.8809323 | 0.8809319 | 1.0255079 | 0.8394874 | 0.2750742 | -0.0206814 | -0.0145164 | 0.2958856 | 0.1503987 | 0.5126743 | 0.7853981 | 3.2804747 |
| | 1.5922378 | 0.0933524 | 0.6538516 | 2.1216640 | 2.2063704 | 1.3401718 | 1.2962685 | | | | | |
| 151 | 0.8801483 | 0.8801480 | 1.0252199 | 0.8385403 | 0.2747540 | -0.0219270 | -0.0154122 | 0.2968510 | 0.1509237 | 0.5126345 | 0.7853981 | 3.2691555 |
| | 1.5909982 | 0.0937376 | 0.6534336 | 2.1216564 | 2.2067194 | 1.3393678 | 1.2951536 | | | | | |
| 152 | 0.8793546 | 0.8793542 | 1.0249310 | 0.8375932 | 0.2744338 | -0.0233825 | -0.0163079 | 0.2978163 | 0.1514478 | 0.5125943 | 0.7853981 | 3.2579098 |
| | 1.5897588 | 0.0941227 | 0.6530156 | 2.1216497 | 2.2070675 | 1.3385629 | 1.2940389 | | | | | |
| 153 | 0.8785651 | 0.8785651 | 1.0246420 | 0.8366463 | 0.2741136 | -0.0246676 | -0.0172031 | 0.2987812 | 0.1519721 | 0.5125545 | 0.7853981 | 3.2467394 |
| | 1.5884886 | 0.0945081 | 0.6525972 | 2.1216421 | 2.2074165 | 1.3377580 | 1.2929239 | | | | | |
| 154 | 0.8777786 | 0.8777782 | 1.0243521 | 0.8356997 | 0.2737933 | -0.0259619 | -0.0181047 | 0.2997552 | 0.1524939 | 0.5125147 | 0.7853981 | 3.2355328 |
| | 1.5872413 | 0.0948935 | 0.6521788 | 2.1216354 | 2.2077627 | 1.3369531 | 1.2918119 | | | | | |
| 155 | 0.8769922 | 0.8769917 | 1.0240602 | 0.8347537 | 0.2734731 | -0.0272523 | -0.0190034 | 0.3007255 | 0.1530133 | 0.5124748 | 0.7853981 | 3.2244396 |
| | 1.5859941 | 0.0952781 | 0.6517612 | 2.1216278 | 2.2081079 | 1.3361473 | 1.2907000 | | | | | |
| 156 | 0.8762057 | 0.8762046 | 1.0237675 | 0.8338076 | 0.2731529 | -0.0285426 | -0.0199019 | 0.3016955 | 0.1535324 | 0.5124350 | 0.7853981 | 3.2134150 |
| | 1.5847464 | 0.0956628 | 0.6513434 | 2.1216221 | 2.2084541 | 1.3353405 | 1.2895880 | | | | | |
| 157 | 0.8754176 | 0.8754172 | 1.0234747 | 0.8328621 | 0.2728327 | -0.0298324 | -0.0207999 | 0.3026651 | 0.1540514 | 0.5123956 | 0.7853981 | 3.2024727 |
| | 1.5834981 | 0.0960475 | 0.6509255 | 2.1216154 | 2.2088013 | 1.3345346 | 1.2884759 | | | | | |
| 158 | 0.8746305 | 0.8746305 | 1.0231800 | 0.8319167 | 0.2725124 | -0.0311157 | -0.0216933 | 0.3036281 | 0.1545681 | 0.5123558 | 0.7853981 | 3.1916656 |
| | 1.5822486 | 0.0964317 | 0.6505080 | 2.1216097 | 2.2091484 | 1.3337278 | 1.2873631 | | | | | |
| 159 | 0.8738446 | 0.8738444 | 1.0228844 | 0.8309717 | 0.2721922 | -0.0324080 | -0.0225930 | 0.3046002 | 0.1550834 | 0.5123163 | 0.7853981 | 3.1808233 |
| | 1.5809954 | 0.0968159 | 0.6500906 | 2.1216039 | 2.2094936 | 1.3329200 | 1.2862530 | | | | | |
| 160 | 0.8730564 | 0.8730560 | 1.0225878 | 0.8300267 | 0.2718720 | -0.0336965 | -0.0234898 | 0.3055685 | 0.1555993 | 0.5122765 | 0.7853981 | 3.1700926 |
| | 1.5797482 | 0.0971999 | 0.6496733 | 2.1215963 | 2.2098398 | 1.3321113 | 1.2851381 | | | | | |
| 161 | 0.8722700 | 0.8722696 | 1.0222902 | 0.8290823 | 0.2715518 | -0.0349787 | -0.0243821 | 0.3065305 | 0.1561128 | 0.5122372 | 0.7853981 | 3.1594954 |
| | 1.5784975 | 0.0975838 | 0.6492561 | 2.1215906 | 2.2101870 | 1.3313036 | 1.2840271 | | | | | |
| 162 | 0.8712445 | 0.8712441 | 1.0219917 | 0.8281378 | 0.2712315 | -0.0351968 | -0.0245327 | 0.3064283 | 0.1567893 | 0.5121859 | 0.7853981 | 3.1606178 |
| | 1.5768681 | 0.0979673 | 0.6488389 | 2.1215829 | 2.2108574 | 1.3304948 | 1.2825775 | | | | | |
| 163 | 0.8706511 | 0.8706507 | 1.0216942 | 0.8271930 | 0.2709113 | -0.0373902 | -0.0260597 | 0.3083015 | 0.1571637 | 0.5121569 | 0.7853981 | 3.1401539 |
| | 1.5759411 | 0.0983508 | 0.6484206 | 2.1215782 | 2.2102289 | 1.3296871 | 1.2817535 | | | | | |
| 164 | 0.8696581 | 0.8696577 | 1.0213947 | 0.8262489 | 0.2705911 | -0.0377389 | -0.0262803 | 0.3083009 | 0.1578237 | 0.5121068 | 0.7853981 | 3.1401701 |
| | 1.5743456 | 0.0987257 | 0.6480029 | 2.1215706 | 2.2115688 | 1.3288784 | 1.2803364 | | | | | |
| 165 | 0.8650825 | 0.8650825 | 1.0210953 | 0.8253049 | 0.2702709 | -0.0399361 | -0.0278107 | 0.3102070 | 0.1581905 | 0.5120770 | 0.7853981 | 3.1195812 |
| | 1.5734301 | 0.0991192 | 0.6475849 | 2.1215668 | 2.2116378 | 1.3280696 | 1.2795229 | | | | | |
| 166 | 0.8680735 | 0.8680730 | 1.0207932 | 0.8243611 | 0.2699506 | -0.0402225 | -0.0280286 | 0.3101732 | 0.1588530 | 0.5120277 | 0.7853981 | 3.1199446 |
| | 1.5718241 | 0.0995035 | 0.6471673 | 2.1215591 | 2.2122793 | 1.3272600 | 1.2778972 | | | | | |
| 167 | 0.8672711 | 0.8672712 | 1.0204935 | 0.8234172 | 0.2696304 | -0.0414396 | -0.0288749 | 0.3110700 | 0.1593741 | 0.5119875 | 0.7853981 | 3.1103449 |
| | 1.5705450 | 0.0998777 | 0.6467487 | 2.1215534 | 2.2124474 | 1.3264522 | 1.2769642 | | | | | |
| 168 | 0.8664796 | 0.8664792 | 1.0201912 | 0.8224738 | 0.2693102 | -0.0426908 | -0.0297440 | 0.3120010 | 0.1598866 | 0.5119482 | 0.7853981 | 3.1004362 |
| | 1.5692862 | 0.1002615 | 0.6463309 | 2.1215497 | 2.2130241 | 1.3256425 | 1.2758446 | | | | | |
| 169 | 0.8656835 | 0.8656835 | 1.0198879 | 0.8215305 | 0.2689900 | -0.0439297 | -0.0306054 | 0.3129187 | 0.1604006 | 0.5119088 | 0.7853981 | 3.0907240 |
| | 1.5680180 | 0.1006452 | 0.6459129 | 2.1215419 | 2.2133656 | 1.3248319 | 1.2747202 | | | | | |
| 170 | 0.8648966 | 0.8648962 | 1.0195837 | 0.8205875 | 0.2686697 | -0.0452011 | -0.0314857 | 0.3138168 | 0.1609079 | 0.5118695 | 0.7853981 | 3.0807066 |
| | 1.5667625 | 0.1010291 | 0.6454951 | 2.1215391 | 2.2137156 | 1.3240223 | 1.2736173 | | | | | |
| 171 | 0.8641036 | 0.8641032 | 1.0192785 | 0.8196446 | 0.2683495 | -0.0464634 | -0.0323650 | 0.3148059 | 0.1614181 | 0.5118302 | 0.7853981 | 3.0708828 |
| | 1.5655012 | 0.1014126 | 0.6450773 | 2.1215324 | 2.2141694 | 1.3232127 | 1.2724867 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 172 | 0.8633071 | 0.8633067 | 1.0189724 | 0.8187022 | 0.2680293 | -0.0476882 | -0.0332182 | 0.3157175 | 0.1619297 | 0.5117908 | 0.7853981 | 3.0614424 |
| | 1.2642290 | 0.1017559 | 0.6446597 | 2.1215286 | 2.2144327 | 1.2623791 | 1.2713614 | | | | | |
| 173 | 0.8625113 | 0.8625179 | 1.0186663 | 0.8177597 | 0.2677091 | -0.0489563 | -0.0340993 | 0.3166654 | 0.1624361 | 0.5117519 | 0.7853981 | 3.0516396 |
| | 1.2629711 | 0.1021758 | 0.6442415 | 2.1215225 | 2.2147837 | 1.2615885 | 1.2702465 | | | | | |
| 174 | 0.8617273 | 0.8617269 | 1.0183592 | 0.8168174 | 0.2673888 | -0.0502113 | -0.0349711 | 0.3176001 | 0.1629429 | 0.5117126 | 0.7853981 | 3.0420275 |
| | 1.2617054 | 0.1025635 | 0.6438234 | 2.1215191 | 2.2151394 | 1.2607779 | 1.2691288 | | | | | |
| 175 | 0.8609356 | 0.8609352 | 1.0180502 | 0.8158156 | 0.2670686 | -0.0514629 | -0.0358405 | 0.3185315 | 0.1634483 | 0.5116736 | 0.7853981 | 3.0325041 |
| | 1.2604458 | 0.1029466 | 0.6434059 | 2.1215143 | 2.2154951 | 1.2599653 | 1.2680101 | | | | | |
| 176 | 0.8601432 | 0.8601428 | 1.0177402 | 0.8149340 | 0.2667484 | -0.0527776 | -0.0367048 | 0.3194559 | 0.1639532 | 0.5116347 | 0.7853981 | 3.0231047 |
| | 1.2591793 | 0.1033256 | 0.6429884 | 2.1215096 | 2.2158518 | 1.2591518 | 1.2668896 | | | | | |
| 177 | 0.8593493 | 0.8593489 | 1.0174303 | 0.8139524 | 0.2664282 | -0.0539520 | -0.0375650 | 0.3203802 | 0.1644591 | 0.5115954 | 0.7853981 | 3.0137596 |
| | 1.2579126 | 0.1037129 | 0.6425705 | 2.1215048 | 2.2162104 | 1.2583403 | 1.2657681 | | | | | |
| 178 | 0.8585585 | 0.8585585 | 1.0171185 | 0.8130512 | 0.2661075 | -0.0552086 | -0.0384415 | 0.3213165 | 0.1649607 | 0.5115564 | 0.7853981 | 3.0043449 |
| | 1.2566502 | 0.1040957 | 0.6421530 | 2.1215000 | 2.2165632 | 1.2575258 | 1.2646513 | | | | | |
| 179 | 0.8577669 | 0.8577669 | 1.0168066 | 0.8121110 | 0.2657877 | -0.0564459 | -0.0393004 | 0.3222336 | 0.1654638 | 0.5115175 | 0.7853981 | 2.9951763 |
| | 1.2553818 | 0.1044788 | 0.6417353 | 2.1214952 | 2.2169228 | 1.2567133 | 1.2635307 | | | | | |
| 180 | 0.8569725 | 0.8569721 | 1.0164938 | 0.8111691 | 0.2654675 | -0.0576860 | -0.0401611 | 0.3231534 | 0.1659667 | 0.5114787 | 0.7853981 | 2.9860296 |
| | 1.2541134 | 0.1048618 | 0.6413174 | 2.1214904 | 2.2172813 | 1.2558985 | 1.2624092 | | | | | |
| 181 | 0.8561827 | 0.8561823 | 1.0161800 | 0.8102283 | 0.2651473 | -0.0589445 | -0.0410245 | 0.3240517 | 0.1664659 | 0.5114397 | 0.7853981 | 2.9767504 |
| | 1.2528517 | 0.1052448 | 0.6408997 | 2.1214856 | 2.2175352 | 1.2550854 | 1.2612934 | | | | | |
| 182 | 0.8553902 | 0.8553898 | 1.0158644 | 0.8092891 | 0.2648270 | -0.0601865 | -0.0418962 | 0.3250135 | 0.1669651 | 0.5114012 | 0.7853981 | 2.9676857 |
| | 1.2515823 | 0.1056270 | 0.6404826 | 2.1214808 | 2.2179918 | 1.2542700 | 1.2601738 | | | | | |
| 183 | 0.8545979 | 0.8545979 | 1.0155487 | 0.8083477 | 0.2645068 | -0.0614317 | -0.0427602 | 0.3259385 | 0.1674638 | 0.5113623 | 0.7853981 | 2.9586391 |
| | 1.2503155 | 0.1060098 | 0.6400648 | 2.1214809 | 2.2183485 | 1.2534546 | 1.2590542 | | | | | |
| 184 | 0.8538076 | 0.8538067 | 1.0152321 | 0.8074074 | 0.2641866 | -0.0626795 | -0.0436257 | 0.3268660 | 0.1679611 | 0.5113238 | 0.7853981 | 2.9496174 |
| | 1.2490454 | 0.1063926 | 0.6396470 | 2.1214771 | 2.2187042 | 1.2526392 | 1.2579365 | | | | | |
| 185 | 0.8530135 | 0.8530135 | 1.0149145 | 0.8064678 | 0.2638664 | -0.0639173 | -0.0444842 | 0.3277836 | 0.1684587 | 0.5112849 | 0.7853981 | 2.9407496 |
| | 1.2477800 | 0.1067749 | 0.6392296 | 2.1214733 | 2.2190628 | 1.2518238 | 1.2568159 | | | | | |
| 186 | 0.8522212 | 0.8522208 | 1.0145969 | 0.8055279 | 0.2635461 | -0.0651553 | -0.0453428 | 0.3287014 | 0.1689559 | 0.5112460 | 0.7853981 | 2.9319096 |
| | 1.2465107 | 0.1071579 | 0.6388115 | 2.1214695 | 2.2194214 | 1.2510184 | 1.2556953 | | | | | |
| 187 | 0.8514287 | 0.8514284 | 1.0142775 | 0.8045886 | 0.2632259 | -0.0663921 | -0.0462003 | 0.3296180 | 0.1694511 | 0.5112075 | 0.7853981 | 2.9231377 |
| | 1.2452414 | 0.1075401 | 0.6383941 | 2.1214657 | 2.2197800 | 1.2501921 | 1.2545757 | | | | | |
| 188 | 0.8506352 | 0.8506352 | 1.0139570 | 0.8036492 | 0.2629057 | -0.0676258 | -0.0470555 | 0.3305314 | 0.1699458 | 0.5111690 | 0.7853981 | 2.9144421 |
| | 1.2439682 | 0.1079224 | 0.6379765 | 2.1214620 | 2.2201395 | 1.2493748 | 1.2534542 | | | | | |
| 189 | 0.8498456 | 0.8498446 | 1.0136356 | 0.8027104 | 0.2625855 | -0.0688711 | -0.0479187 | 0.3314566 | 0.1704277 | 0.5111306 | 0.7853981 | 2.9056826 |
| | 1.2427017 | 0.1083044 | 0.6375592 | 2.1214600 | 2.2204943 | 1.2485575 | 1.2523375 | | | | | |
| 190 | 0.8490542 | 0.8490542 | 1.0133133 | 0.8017715 | 0.2622652 | -0.0701198 | -0.0487842 | 0.3323850 | 0.1709287 | 0.5110921 | 0.7853981 | 2.8969393 |
| | 1.2414352 | 0.1086865 | 0.6371418 | 2.1214561 | 2.2208493 | 1.2477402 | 1.2512207 | | | | | |
| 191 | 0.8482614 | 0.8482610 | 1.0129900 | 0.8008331 | 0.2619450 | -0.0713552 | -0.0496403 | 0.3333002 | 0.1714203 | 0.5110536 | 0.7853981 | 2.8883657 |
| | 1.2401640 | 0.1090682 | 0.6367246 | 2.1214533 | 2.2212067 | 1.2469219 | 1.2501001 | | | | | |
| 192 | 0.8474677 | 0.8474673 | 1.0126657 | 0.7998946 | 0.2616248 | -0.0725775 | -0.0504870 | 0.3342022 | 0.1719115 | 0.5110151 | 0.7853981 | 2.8799610 |
| | 1.2388885 | 0.1094500 | 0.6363072 | 2.1214514 | 2.2215691 | 1.2461037 | 1.2489786 | | | | | |
| 193 | 0.8466752 | 0.8466748 | 1.0123415 | 0.7989562 | 0.2613046 | -0.0738088 | -0.0513399 | 0.3351133 | 0.1724018 | 0.5109771 | 0.7853981 | 2.8715143 |
| | 1.2376158 | 0.1098322 | 0.6358894 | 2.1214485 | 2.2219286 | 1.2452854 | 1.2478580 | | | | | |
| 194 | 0.8458841 | 0.8458838 | 1.0120153 | 0.7980179 | 0.2609843 | -0.0750553 | -0.0522032 | 0.3360356 | 0.1728853 | 0.5109386 | 0.7853981 | 2.8629732 |
| | 1.2363474 | 0.1102141 | 0.6354720 | 2.1214447 | 2.2222834 | 1.2444662 | 1.2467403 | | | | | |
| 195 | 0.8450937 | 0.8450934 | 1.0116892 | 0.7970802 | 0.2606641 | -0.0762922 | -0.0530599 | 0.3369563 | 0.1733762 | 0.5109006 | 0.7853981 | 2.8545656 |
| | 1.2350761 | 0.1105959 | 0.6350544 | 2.1214437 | 2.2226410 | 1.2436470 | 1.2456236 | | | | | |
| 196 | 0.8443001 | 0.8443004 | 1.0113611 | 0.7961426 | 0.2603439 | -0.0775223 | -0.0539116 | 0.3378662 | 0.1738630 | 0.5108621 | 0.7853981 | 2.8462629 |
| | 1.2338035 | 0.1109773 | 0.6346373 | 2.1214389 | 2.2229996 | 1.2428268 | 1.2445033 | | | | | |
| 197 | 0.8435068 | 0.8435061 | 1.0110321 | 0.7952055 | 0.2600237 | -0.0787516 | -0.0547625 | 0.3387753 | 0.1743482 | 0.5108240 | 0.7853981 | 2.8380098 |
| | 1.2325298 | 0.1113585 | 0.6342203 | 2.1214380 | 2.2233582 | 1.2420057 | 1.2433834 | | | | | |
| 198 | 0.8427156 | 0.8427153 | 1.0107021 | 0.7942685 | 0.2597035 | -0.0799777 | -0.0556111 | 0.3396811 | 0.1748329 | 0.5107860 | 0.7853981 | 2.8298292 |
| | 1.2312546 | 0.1117356 | 0.6338033 | 2.1214361 | 2.2237186 | 1.2411856 | 1.2422628 | | | | | |
| 199 | 0.8419222 | 0.8419218 | 1.0103722 | 0.7933313 | 0.2593833 | -0.0812033 | -0.0564593 | 0.3405865 | 0.1753181 | 0.5107479 | 0.7853981 | 2.8216934 |
| | 1.2299787 | 0.1121212 | 0.6333857 | 2.1214342 | 2.2240782 | 1.2403645 | 1.2411421 | | | | | |
| 200 | 0.8411306 | 0.8411303 | 1.0100412 | 0.7923942 | 0.2590631 | -0.0824281 | -0.0573137 | 0.3414911 | 0.1758019 | 0.5107098 | 0.7853981 | 2.8135185 |
| | 1.2287056 | 0.1125029 | 0.6329680 | 2.1214323 | 2.2244378 | 1.2395433 | 1.2400236 | | | | | |
| 201 | 0.8403355 | 0.8403355 | 1.0097094 | 0.7914575 | 0.2587428 | -0.0836718 | -0.0581672 | 0.3424146 | 0.1762823 | 0.5106718 | 0.7853981 | 2.8053951 |
| | 1.2274334 | 0.1128843 | 0.6325505 | 2.1214314 | 2.2247934 | 1.2387222 | 1.2389059 | | | | | |
| 202 | 0.8395478 | 0.8395475 | 1.0093765 | 0.7905208 | 0.2584226 | -0.0849158 | -0.0590209 | 0.3433284 | 0.1767637 | 0.5106338 | 0.7853981 | 2.7973108 |
| | 1.2261582 | 0.1132654 | 0.6321329 | 2.1214285 | 2.2251511 | 1.2378932 | 1.2377863 | | | | | |
| 203 | 0.8387535 | 0.8387535 | 1.0090427 | 0.7895845 | 0.2581024 | -0.0861601 | -0.0598606 | 0.3442225 | 0.1772453 | 0.5105961 | 0.7853981 | 2.7894402 |
| | 1.2248795 | 0.1136468 | 0.6317155 | 2.1214266 | 2.2255144 | 1.2370771 | 1.2366648 | | | | | |
| 204 | 0.8379626 | 0.8379624 | 1.0087080 | 0.7886482 | 0.2577821 | -0.0873960 | -0.0607153 | 0.3451391 | 0.1777239 | 0.5105581 | 0.7853981 | 2.7814198 |
| | 1.2236052 | 0.1140280 | 0.6312980 | 2.1214256 | 2.2258711 | 1.2362541 | 1.2355471 | | | | | |
| 205 | 0.8371676 | 0.8371673 | 1.0083733 | 0.7877122 | 0.2574619 | -0.0886225 | -0.0615521 | 0.3460484 | 0.1782054 | 0.5105200 | 0.7853981 | 2.7736616 |
| | 1.2223255 | 0.1144095 | 0.6308801 | 2.1214237 | 2.2262354 | 1.2354321 | 1.2344236 | | | | | |
| 206 | 0.8363756 | 0.8363756 | 1.0080366 | 0.7867764 | 0.2571416 | -0.0898449 | -0.0624012 | 0.3469366 | 0.1786830 | 0.5104825 | 0.7853981 | 2.7657862 |
| | 1.2210498 | 0.1147906 | 0.6304626 | 2.1214218 | 2.2265943 | 1.2346101 | 1.2333141 | | | | | |
| 207 | 0.8355836 | 0.8355833 | 1.0077000 | 0.7858406 | 0.2568215 | -0.0910667 | -0.0632455 | 0.3478381 | 0.1791602 | 0.5104449 | 0.7853981 | 2.7580080 |
| | 1.2197716 | 0.1151720 | 0.6300447 | 2.1214218 | 2.2269545 | 1.2337941 | 1.2321454 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 208 | 0.8347901 | 0.8347857 | 1.0073614 | 0.7849051 | 0.2565014 | -0.0922387 | -0.0640901 | 0.3487399 | 0.1796367 | 0.5104068 | 0.7853981 | 2.7592651 |
| | 1.5184937 | 0.1155528 | 0.6296213 | 2.1214199 | 2.2273140 | 1.3329601 | 1.2310638 | | | | | |
| 209 | 0.8339993 | 0.8339589 | 1.0070225 | 0.7839695 | 0.2561819 | -0.0934722 | -0.0649424 | 0.3496532 | 0.1801113 | 0.5103692 | 0.7853981 | 2.7424631 |
| | 1.5172188 | 0.1159341 | 0.6292093 | 2.1214180 | 2.2276716 | 1.3321352 | 1.2299461 | | | | | |
| 210 | 0.8332052 | 0.8332049 | 1.0066824 | 0.7830343 | 0.2558617 | -0.0946835 | -0.0657790 | 0.3505442 | 0.1805863 | 0.5103316 | 0.7853981 | 2.7348900 |
| | 1.5159345 | 0.1163149 | 0.6287918 | 2.1214189 | 2.2283350 | 1.3313093 | 1.2288237 | | | | | |
| 211 | 0.8324152 | 0.8324148 | 1.0063410 | 0.7820995 | 0.2555405 | -0.0959128 | -0.0666280 | 0.3514534 | 0.1810575 | 0.5102943 | 0.7853981 | 2.7271996 |
| | 1.5146608 | 0.1166955 | 0.6283746 | 2.1214170 | 2.2289916 | 1.3304834 | 1.2277079 | | | | | |
| 212 | 0.8316221 | 0.8316217 | 1.0059986 | 0.7811650 | 0.2552203 | -0.0971327 | -0.0674704 | 0.3523530 | 0.1815298 | 0.5102567 | 0.7853981 | 2.7196274 |
| | 1.5133810 | 0.1170759 | 0.6279573 | 2.1214161 | 2.2287521 | 1.3296576 | 1.2265873 | | | | | |
| 213 | 0.8308256 | 0.8308287 | 1.0056562 | 0.7802392 | 0.2549001 | -0.0983489 | -0.0683101 | 0.3532490 | 0.1820021 | 0.5102191 | 0.7853981 | 2.7121229 |
| | 1.5121002 | 0.1174567 | 0.6275395 | 2.1214161 | 2.2291136 | 1.3288317 | 1.2254667 | | | | | |
| 214 | 0.8300343 | 0.8300343 | 1.0053129 | 0.7792956 | 0.2545798 | -0.0995552 | -0.0691428 | 0.3541350 | 0.1824743 | 0.5101815 | 0.7853981 | 2.7047167 |
| | 1.5108156 | 0.1178277 | 0.6271215 | 2.1214161 | 2.2294779 | 1.3280048 | 1.2243443 | | | | | |
| 215 | 0.8292428 | 0.8292422 | 1.0049686 | 0.7783613 | 0.2542596 | -0.1007735 | -0.0699837 | 0.3550331 | 0.1829441 | 0.5101443 | 0.7853981 | 2.6972876 |
| | 1.5095356 | 0.1182184 | 0.6267037 | 2.1214151 | 2.2298384 | 1.3271780 | 1.2232246 | | | | | |
| 216 | 0.8284516 | 0.8284513 | 1.0046234 | 0.7774272 | 0.2539394 | -0.1019972 | -0.0708280 | 0.3559366 | 0.1834120 | 0.5101071 | 0.7853981 | 2.6898289 |
| | 1.5082565 | 0.1185991 | 0.6262860 | 2.1214151 | 2.2301970 | 1.3263512 | 1.2221069 | | | | | |
| 217 | 0.8276555 | 0.8276555 | 1.0042763 | 0.7764934 | 0.2536192 | -0.1032124 | -0.0716594 | 0.3568216 | 0.1838813 | 0.5100695 | 0.7853981 | 2.6825581 |
| | 1.5069704 | 0.1189792 | 0.6258687 | 2.1214142 | 2.2305613 | 1.3255224 | 1.2209826 | | | | | |
| 218 | 0.8268632 | 0.8268630 | 1.0039291 | 0.7755595 | 0.2532989 | -0.1044194 | -0.0724992 | 0.3577183 | 0.1843484 | 0.5100323 | 0.7853981 | 2.6752253 |
| | 1.5056896 | 0.1193597 | 0.6254508 | 2.1214142 | 2.2309217 | 1.3246937 | 1.2198629 | | | | | |
| 219 | 0.8260697 | 0.8260693 | 1.0035820 | 0.7746258 | 0.2529787 | -0.1056231 | -0.0733293 | 0.3586019 | 0.1848163 | 0.5099950 | 0.7853981 | 2.6680359 |
| | 1.5044141 | 0.1197406 | 0.6250326 | 2.1214151 | 2.2312863 | 1.3238659 | 1.2187414 | | | | | |
| 220 | 0.8252787 | 0.8252783 | 1.0032320 | 0.7736922 | 0.2526585 | -0.1068451 | -0.0741719 | 0.3595036 | 0.1852795 | 0.5099579 | 0.7853981 | 2.6607323 |
| | 1.5031242 | 0.1201208 | 0.6246151 | 2.1214151 | 2.2316446 | 1.3230362 | 1.2176237 | | | | | |
| 221 | 0.8244846 | 0.8244842 | 1.0028830 | 0.7727591 | 0.2523383 | -0.1080514 | -0.0750036 | 0.3603857 | 0.1857457 | 0.5099207 | 0.7853981 | 2.6535502 |
| | 1.5018387 | 0.1205013 | 0.6241971 | 2.1214151 | 2.2320000 | 1.3222075 | 1.2165012 | | | | | |
| 222 | 0.8236933 | 0.8236929 | 1.0025320 | 0.7718256 | 0.2520181 | -0.1092756 | -0.0758474 | 0.3612936 | 0.1862082 | 0.5098835 | 0.7853981 | 2.6463385 |
| | 1.5005585 | 0.1208818 | 0.6237791 | 2.1214151 | 2.2323666 | 1.3213778 | 1.2153835 | | | | | |
| 223 | 0.8229002 | 0.8228979 | 1.0021811 | 0.7708927 | 0.2516978 | -0.1104714 | -0.0766716 | 0.3621653 | 0.1866732 | 0.5098463 | 0.7853981 | 2.6393471 |
| | 1.4992784 | 0.1212623 | 0.6233605 | 2.1214161 | 2.2327328 | 1.3205481 | 1.2142601 | | | | | |
| 224 | 0.8221033 | 0.8221030 | 1.0018282 | 0.7699596 | 0.2513776 | -0.1116762 | -0.0775017 | 0.3630537 | 0.1871362 | 0.5098091 | 0.7853981 | 2.6323175 |
| | 1.4979836 | 0.1216425 | 0.6229429 | 2.1214161 | 2.2330971 | 1.3197165 | 1.2131367 | | | | | |
| 225 | 0.8213123 | 0.8213120 | 1.0014753 | 0.7690270 | 0.2510574 | -0.1128896 | -0.0783378 | 0.3639470 | 0.1875964 | 0.5097724 | 0.7853981 | 2.6252518 |
| | 1.4966952 | 0.1220231 | 0.6225247 | 2.1214180 | 2.2334576 | 1.3188858 | 1.2120190 | | | | | |
| 226 | 0.8205196 | 0.8205186 | 1.0011206 | 0.7680947 | 0.2507371 | -0.1140934 | -0.0791669 | 0.3648306 | 0.1880564 | 0.5097352 | 0.7853981 | 2.6182547 |
| | 1.4954128 | 0.1224030 | 0.6221070 | 2.1214190 | 2.2338209 | 1.3180542 | 1.2108974 | | | | | |
| 227 | 0.8197258 | 0.8197255 | 1.0007648 | 0.7671627 | 0.2504169 | -0.1153025 | -0.0799996 | 0.3657154 | 0.1885152 | 0.5096984 | 0.7853981 | 2.6113291 |
| | 1.4941272 | 0.1227826 | 0.6216894 | 2.1214199 | 2.2341824 | 1.3172216 | 1.2097769 | | | | | |
| 228 | 0.8189327 | 0.8189324 | 1.0004091 | 0.7662301 | 0.2500967 | -0.1165150 | -0.0808346 | 0.3666117 | 0.1889741 | 0.5096613 | 0.7853981 | 2.6043673 |
| | 1.4928411 | 0.1231632 | 0.6212709 | 2.1214199 | 2.2345439 | 1.3163900 | 1.2086563 | | | | | |
| 229 | 0.8181387 | 0.8181383 | 1.0000515 | 0.7652983 | 0.2497765 | -0.1177137 | -0.0816597 | 0.3674902 | 0.1894316 | 0.5096245 | 0.7853981 | 2.5975456 |
| | 1.4915532 | 0.1235428 | 0.6208531 | 2.1214218 | 2.2349081 | 1.3155565 | 1.2075348 | | | | | |
| 230 | 0.8173447 | 0.8173443 | 0.9996947 | 0.7643659 | 0.2494562 | -0.1189128 | -0.0824851 | 0.3683690 | 0.1898901 | 0.5095878 | 0.7853981 | 2.5907536 |
| | 1.4902635 | 0.1239238 | 0.6204340 | 2.1214228 | 2.2352734 | 1.3147249 | 1.2064121 | | | | | |
| 231 | 0.8165489 | 0.8165486 | 0.9993373 | 0.7634339 | 0.2491360 | -0.1201175 | -0.0833072 | 0.3692436 | 0.1903490 | 0.5095510 | 0.7853981 | 2.5840244 |
| | 1.4889717 | 0.1243043 | 0.6200153 | 2.1214237 | 2.2356396 | 1.3138914 | 1.2052879 | | | | | |
| 232 | 0.8157566 | 0.8157563 | 0.9989788 | 0.7625015 | 0.2488158 | -0.1213115 | -0.0841356 | 0.3701273 | 0.1908047 | 0.5095143 | 0.7853981 | 2.5772552 |
| | 1.4876852 | 0.1246853 | 0.6195960 | 2.1214256 | 2.2360039 | 1.3130589 | 1.2041683 | | | | | |
| 233 | 0.8149657 | 0.8149653 | 0.9986191 | 0.7615702 | 0.2484956 | -0.1225243 | -0.0849701 | 0.3710099 | 0.1912589 | 0.5094779 | 0.7853981 | 2.5704489 |
| | 1.4863987 | 0.1250657 | 0.6191773 | 2.1214295 | 2.2363644 | 1.3122253 | 1.2030506 | | | | | |
| 234 | 0.8141680 | 0.8141676 | 0.9982594 | 0.7606386 | 0.2481753 | -0.1237057 | -0.0857825 | 0.3718810 | 0.1917159 | 0.5094407 | 0.7853981 | 2.5639133 |
| | 1.4851127 | 0.1254466 | 0.6187579 | 2.1214294 | 2.2367253 | 1.3113918 | 1.2019234 | | | | | |
| 235 | 0.8133682 | 0.8133678 | 0.9978983 | 0.7597071 | 0.2478551 | -0.1248740 | -0.0865934 | 0.3727492 | 0.1921703 | 0.5093948 | 0.7853981 | 2.5643063 |
| | 1.4838276 | 0.1258171 | 0.6183389 | 2.1214323 | 2.2370867 | 1.3105574 | 1.2007110 | | | | | |
| 236 | 0.8125685 | 0.8125685 | 0.9975364 | 0.7587757 | 0.2475349 | -0.1260574 | -0.0873994 | 0.3735923 | 0.1926309 | 0.5093669 | 0.7853981 | 2.5510092 |
| | 1.4825044 | 0.1262075 | 0.6179194 | 2.1214323 | 2.2374792 | 1.3097229 | 1.1996641 | | | | | |
| 237 | 0.8115751 | 0.8115748 | 0.9971774 | 0.7578447 | 0.2472147 | -0.1263499 | -0.0875569 | 0.3736646 | 0.1932182 | 0.5093213 | 0.7853981 | 2.5512171 |
| | 1.4808874 | 0.1265776 | 0.6175009 | 2.1214361 | 2.2381229 | 1.3098465 | 1.1982603 | | | | | |
| 238 | 0.8107736 | 0.8107734 | 0.9966079 | 0.7569138 | 0.2468944 | -0.1275392 | -0.0883929 | 0.3744426 | 0.1936738 | 0.5092847 | 0.7853981 | 2.5449381 |
| | 1.4795828 | 0.1269575 | 0.6170819 | 2.1214380 | 2.2384996 | 1.3080511 | 1.1971273 | | | | | |
| 239 | 0.8099793 | 0.8099789 | 0.9964436 | 0.7559827 | 0.2465742 | -0.1287054 | -0.0892155 | 0.3752797 | 0.1941250 | 0.5092479 | 0.7853981 | 2.5383949 |
| | 1.4782908 | 0.1273383 | 0.6166622 | 2.1214405 | 2.2388649 | 1.3072147 | 1.1960049 | | | | | |
| 240 | 0.8091835 | 0.8091835 | 0.9960790 | 0.7550517 | 0.2462540 | -0.1298935 | -0.0900319 | 0.3761475 | 0.1945765 | 0.5092115 | 0.7853981 | 2.5319500 |
| | 1.4769955 | 0.1277190 | 0.6162425 | 2.1214437 | 2.2392330 | 1.3063784 | 1.1948814 | | | | | |
| 241 | 0.8083856 | 0.8083853 | 0.9957130 | 0.7541210 | 0.2459338 | -0.1310714 | -0.0908409 | 0.3770052 | 0.1950286 | 0.5091752 | 0.7853981 | 2.5256081 |
| | 1.4756947 | 0.1280999 | 0.6158225 | 2.1214457 | 2.2396049 | 1.3055420 | 1.1937532 | | | | | |
| 242 | 0.8075915 | 0.8075902 | 0.9953465 | 0.7531902 | 0.2456135 | -0.1322617 | -0.0916585 | 0.3778752 | 0.1954789 | 0.5091385 | 0.7853981 | 2.5192013 |
| | 1.4744005 | 0.1284806 | 0.6154026 | 2.1214485 | 2.2399771 | 1.3047056 | 1.1926298 | | | | | |
| 243 | 0.8067933 | 0.8067930 | 0.9949791 | 0.7522597 | 0.2452933 | -0.1334416 | -0.0924686 | 0.3787349 | 0.1959279 | 0.5091022 | 0.7853981 | 2.5128994 |
| | 1.4731016 | 0.1288615 | 0.6149825 | 2.1214514 | 2.2403431 | 1.3038683 | 1.1915035 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 244 | 0.8059981 | 0.8059978 | 0.9946108 | 0.7513294 | 0.2449731 | -0.1346277 | -0.0932829 | 0.3796008 | 0.1963755 | 0.5090659 | 0.7853981 | 2.5065804 |
| | 1.4718056 | 0.1292424 | 0.6145623 | 2.1214542 | 2.2407112 | 1.2033310 | 1.1503801 | | | | | |
| 245 | 0.8052024 | 0.8052021 | 0.9942417 | 0.7503592 | 0.2446529 | -0.1358130 | -0.0940965 | 0.3804659 | 0.1968228 | 0.5090296 | 0.7853981 | 2.5002928 |
| | 1.4705086 | 0.1296232 | 0.6141422 | 2.1214571 | 2.2410993 | 1.2021936 | 1.1892557 | | | | | |
| 246 | 0.8044053 | 0.8044050 | 0.9938710 | 0.7494686 | 0.2443326 | -0.1369219 | -0.0949056 | 0.3813245 | 0.1972654 | 0.5089933 | 0.7853981 | 2.4940796 |
| | 1.4692078 | 0.1300039 | 0.6137220 | 2.1214609 | 2.2414503 | 1.2013544 | 1.1881294 | | | | | |
| 247 | 0.8036084 | 0.8036087 | 0.9935014 | 0.7485386 | 0.2440124 | -0.1381636 | -0.0957094 | 0.3821760 | 0.1977170 | 0.5089569 | 0.7853981 | 2.4879446 |
| | 1.4679075 | 0.1303856 | 0.6133008 | 2.1214638 | 2.2418242 | 1.2005171 | 1.1870031 | | | | | |
| 248 | 0.8028110 | 0.8028107 | 0.9931298 | 0.7476085 | 0.2436922 | -0.1393383 | -0.0965152 | 0.3830304 | 0.1981628 | 0.5089210 | 0.7853981 | 2.4818144 |
| | 1.4666052 | 0.1307663 | 0.6128804 | 2.1214676 | 2.2421961 | 1.2996778 | 1.1858759 | | | | | |
| 249 | 0.8020146 | 0.8020142 | 0.9927568 | 0.7466780 | 0.2433721 | -0.1405215 | -0.0973267 | 0.3838934 | 0.1986066 | 0.5088847 | 0.7853981 | 2.4756458 |
| | 1.4653063 | 0.1311470 | 0.6124601 | 2.1214705 | 2.2425652 | 1.2988377 | 1.1847506 | | | | | |
| 250 | 0.8012186 | 0.8012180 | 0.9923835 | 0.7457460 | 0.2430517 | -0.1417043 | -0.0981378 | 0.3847561 | 0.1990500 | 0.5088488 | 0.7853981 | 2.4695129 |
| | 1.4640064 | 0.1315278 | 0.6120394 | 2.1214743 | 2.2429342 | 1.2979975 | 1.1836262 | | | | | |
| 251 | 0.8004230 | 0.8004227 | 0.9920084 | 0.7448134 | 0.2427315 | -0.1428836 | -0.0989463 | 0.3856151 | 0.1994909 | 0.5088125 | 0.7853981 | 2.4634275 |
| | 1.4627075 | 0.1319084 | 0.6116191 | 2.1214781 | 2.2433033 | 1.2971573 | 1.1825018 | | | | | |
| 252 | 0.7996245 | 0.7996245 | 0.9916334 | 0.7438802 | 0.2424113 | -0.1440532 | -0.0997480 | 0.3864645 | 0.1999339 | 0.5087766 | 0.7853981 | 2.4574366 |
| | 1.4614038 | 0.1322855 | 0.6111980 | 2.1214819 | 2.2436771 | 1.2963171 | 1.1813745 | | | | | |
| 253 | 0.7988287 | 0.7988284 | 0.9912576 | 0.7429609 | 0.2420911 | -0.1452249 | -0.1005509 | 0.3873159 | 0.2003748 | 0.5087407 | 0.7853981 | 2.4514561 |
| | 1.4601011 | 0.1326705 | 0.6107770 | 2.1214867 | 2.2440491 | 1.2954760 | 1.1802492 | | | | | |
| 254 | 0.7980305 | 0.7980301 | 0.9908798 | 0.7420320 | 0.2417708 | -0.1464029 | -0.1013581 | 0.3881737 | 0.2008149 | 0.5087044 | 0.7853981 | 2.4454556 |
| | 1.4587984 | 0.1330509 | 0.6103565 | 2.1214905 | 2.2444191 | 1.2946339 | 1.1791229 | | | | | |
| 255 | 0.7972344 | 0.7972340 | 0.9905012 | 0.7411031 | 0.2414506 | -0.1475770 | -0.1021624 | 0.3890276 | 0.2012529 | 0.5086688 | 0.7853981 | 2.4395075 |
| | 1.4574957 | 0.1334313 | 0.6099355 | 2.1214943 | 2.2447901 | 1.2937908 | 1.1779966 | | | | | |
| 256 | 0.7964367 | 0.7964364 | 0.9901220 | 0.7401741 | 0.2411304 | -0.1487532 | -0.1029678 | 0.3898836 | 0.2016914 | 0.5086326 | 0.7853981 | 2.4335699 |
| | 1.4561920 | 0.1338120 | 0.6095150 | 2.1214981 | 2.2451611 | 1.2929470 | 1.1768694 | | | | | |
| 257 | 0.7956393 | 0.7956390 | 0.9897419 | 0.7392455 | 0.2408101 | -0.1499205 | -0.1037672 | 0.3907306 | 0.2021287 | 0.5085971 | 0.7853981 | 2.4277191 |
| | 1.4548874 | 0.1341923 | 0.6090944 | 2.1215029 | 2.2455339 | 1.2921047 | 1.1757431 | | | | | |
| 258 | 0.7948416 | 0.7948412 | 0.9893609 | 0.7383168 | 0.2404899 | -0.1510840 | -0.1045637 | 0.3915739 | 0.2025655 | 0.5085613 | 0.7853981 | 2.4219170 |
| | 1.4535795 | 0.1345732 | 0.6086731 | 2.1215096 | 2.2459087 | 1.2912617 | 1.1746159 | | | | | |
| 259 | 0.7940460 | 0.7940456 | 0.9889792 | 0.7373885 | 0.2401696 | -0.1522659 | -0.1053720 | 0.3924346 | 0.2030000 | 0.5085254 | 0.7853981 | 2.4160194 |
| | 1.4522791 | 0.1349538 | 0.6082520 | 2.1215124 | 2.2462769 | 1.2904177 | 1.1734915 | | | | | |
| 260 | 0.7932482 | 0.7932479 | 0.9885960 | 0.7364601 | 0.2398494 | -0.1534272 | -0.1061673 | 0.3932767 | 0.2034345 | 0.5084899 | 0.7853981 | 2.4102745 |
| | 1.4509766 | 0.1353341 | 0.6078311 | 2.1215181 | 2.2466537 | 1.2895727 | 1.1723642 | | | | | |
| 261 | 0.7924515 | 0.7924516 | 0.9882109 | 0.7355322 | 0.2395292 | -0.1545806 | -0.1069773 | 0.3941398 | 0.2038661 | 0.5084540 | 0.7853981 | 2.4044985 |
| | 1.4496698 | 0.1357138 | 0.6074107 | 2.1215219 | 2.2470179 | 1.2887268 | 1.1712399 | | | | | |
| 262 | 0.7916505 | 0.7916502 | 0.9878272 | 0.7346039 | 0.2392090 | -0.1557564 | -0.1077607 | 0.3949654 | 0.2043026 | 0.5084184 | 0.7853981 | 2.3988218 |
| | 1.4483547 | 0.1360949 | 0.6069888 | 2.1215277 | 2.2473984 | 1.2878815 | 1.1701069 | | | | | |
| 263 | 0.7908531 | 0.7908534 | 0.9874422 | 0.7336755 | 0.2388887 | -0.1569327 | -0.1085652 | 0.3958214 | 0.2047347 | 0.5083826 | 0.7853981 | 2.3930521 |
| | 1.4470501 | 0.1364758 | 0.6065671 | 2.1215324 | 2.2477684 | 1.2870359 | 1.1689816 | | | | | |
| 264 | 0.7900555 | 0.7900555 | 0.9870568 | 0.7327476 | 0.2385685 | -0.1580957 | -0.1093603 | 0.3966642 | 0.2051672 | 0.5083472 | 0.7853981 | 2.3873540 |
| | 1.4457426 | 0.1368569 | 0.6061451 | 2.1215382 | 2.2481422 | 1.2861910 | 1.1678543 | | | | | |
| 265 | 0.7892591 | 0.7892588 | 0.9866709 | 0.7318195 | 0.2382483 | -0.1592587 | -0.1101553 | 0.3975070 | 0.2055983 | 0.5083117 | 0.7853981 | 2.3817596 |
| | 1.4444342 | 0.1372382 | 0.6057228 | 2.1215439 | 2.2485177 | 1.2853451 | 1.1667280 | | | | | |
| 266 | 0.7884609 | 0.7884604 | 0.9862825 | 0.7308919 | 0.2379281 | -0.1604207 | -0.1109495 | 0.3983488 | 0.2060285 | 0.5082762 | 0.7853981 | 2.3761530 |
| | 1.4431248 | 0.1376187 | 0.6053013 | 2.1215496 | 2.2488959 | 1.2844973 | 1.1655998 | | | | | |
| 267 | 0.7876604 | 0.7876600 | 0.9858944 | 0.7299641 | 0.2376078 | -0.1615767 | -0.1117455 | 0.3991845 | 0.2064596 | 0.5082407 | 0.7853981 | 2.3706093 |
| | 1.4418106 | 0.1379998 | 0.6048789 | 2.1215553 | 2.2492676 | 1.2836504 | 1.1644688 | | | | | |
| 268 | 0.7868621 | 0.7868617 | 0.9855057 | 0.7290363 | 0.2372876 | -0.1627307 | -0.1125346 | 0.4000283 | 0.2068890 | 0.5082053 | 0.7853981 | 2.3650351 |
| | 1.4405022 | 0.1383810 | 0.6044565 | 2.1215601 | 2.2496414 | 1.2828026 | 1.1633415 | | | | | |
| 269 | 0.7860647 | 0.7860644 | 0.9851157 | 0.7281099 | 0.2369674 | -0.1638814 | -0.1133274 | 0.4008688 | 0.2073165 | 0.5081698 | 0.7853981 | 2.3595047 |
| | 1.4391928 | 0.1387625 | 0.6040337 | 2.1215668 | 2.2500152 | 1.2819557 | 1.1622143 | | | | | |
| 270 | 0.7852677 | 0.7852673 | 0.9847246 | 0.7271818 | 0.2366472 | -0.1650276 | -0.1141238 | 0.4017148 | 0.2077426 | 0.5081348 | 0.7853981 | 2.3539600 |
| | 1.4378834 | 0.1391430 | 0.6036118 | 2.1215725 | 2.2503891 | 1.2811069 | 1.1610980 | | | | | |
| 271 | 0.7844698 | 0.7844676 | 0.9843329 | 0.7262545 | 0.2363269 | -0.1662240 | -0.1149132 | 0.4025509 | 0.2081691 | 0.5080993 | 0.7853981 | 2.3485012 |
| | 1.4365711 | 0.1395241 | 0.6031893 | 2.1215752 | 2.2507648 | 1.2802582 | 1.1599588 | | | | | |
| 272 | 0.7836687 | 0.7836683 | 0.9839395 | 0.7253275 | 0.2360067 | -0.1673771 | -0.1157023 | 0.4033838 | 0.2085944 | 0.5080638 | 0.7853981 | 2.3430853 |
| | 1.4352575 | 0.1399044 | 0.6027673 | 2.1215849 | 2.2511426 | 1.2794075 | 1.1588287 | | | | | |
| 273 | 0.7828705 | 0.7828705 | 0.9835452 | 0.7244002 | 0.2356865 | -0.1685346 | -0.1164930 | 0.4042251 | 0.2090191 | 0.5080287 | 0.7853981 | 2.3376960 |
| | 1.4339466 | 0.1402860 | 0.6023440 | 2.1215916 | 2.2515154 | 1.2785587 | 1.1577024 | | | | | |
| 274 | 0.7820704 | 0.7820700 | 0.9831517 | 0.7234731 | 0.2353663 | -0.1696906 | -0.1172790 | 0.4050569 | 0.2094452 | 0.5079933 | 0.7853981 | 2.3322687 |
| | 1.4326305 | 0.1406674 | 0.6019208 | 2.1215982 | 2.2518933 | 1.2777090 | 1.1565704 | | | | | |
| 275 | 0.7812735 | 0.7812735 | 0.9827557 | 0.7225463 | 0.2350460 | -0.1708440 | -0.1180726 | 0.4058801 | 0.2098662 | 0.5079583 | 0.7853981 | 2.3268499 |
| | 1.4313211 | 0.1410484 | 0.6014981 | 2.1216049 | 2.2522659 | 1.2768583 | 1.1554451 | | | | | |
| 276 | 0.7804766 | 0.7804762 | 0.9823591 | 0.7216197 | 0.2347258 | -0.1719941 | -0.1188638 | 0.4067000 | 0.2102870 | 0.5079232 | 0.7853981 | 2.3214741 |
| | 1.4300056 | 0.1414293 | 0.6010752 | 2.1216116 | 2.2526393 | 1.2760067 | 1.1543188 | | | | | |
| 277 | 0.7796797 | 0.7796793 | 0.9819621 | 0.7206932 | 0.2344056 | -0.1731520 | -0.1196395 | 0.4075176 | 0.2107114 | 0.5078881 | 0.7853981 | 2.3162584 |
| | 1.4286888 | 0.1418104 | 0.6006519 | 2.1216192 | 2.2529717 | 1.2751551 | 1.1531849 | | | | | |
| 278 | 0.7788853 | 0.7788849 | 0.9815638 | 0.7197664 | 0.2341854 | -0.1743038 | -0.1204295 | 0.4083962 | 0.2111313 | 0.5078532 | 0.7853981 | 2.3109322 |
| | 1.4273735 | 0.1421916 | 0.6002287 | 2.1216259 | 2.2533960 | 1.2743025 | 1.1520567 | | | | | |
| 279 | 0.7780756 | 0.7780752 | 0.9811663 | 0.7188395 | 0.2338651 | -0.1754516 | -0.1212152 | 0.4092287 | 0.2115531 | 0.5078181 | 0.7853981 | 2.3056641 |
| | 1.4260582 | 0.1425736 | 0.5998045 | 2.1216326 | 2.2537737 | 1.2734518 | 1.1509265 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 280 | 0.7772774 | 0.7772771 | 0.9807664 | 0.7179132 | 0.2336449 | -0.1766181 | -0.1220019 | 0.4100630 | 0.2119713 | 0.5077831 | 0.7853981 | 2.3004036 |
| | 1.4247446 | 0.1429549 | 0.5993809 | 2.1216402 | 2.2541494 | 1.2725992 | 1.1497553 | | | | | |
| 281 | 0.7764766 | 0.7764763 | 0.9803658 | 0.7169871 | 0.2331247 | -0.1777602 | -0.1227798 | 0.4108849 | 0.2123905 | 0.5077481 | 0.7853981 | 2.2952433 |
| | 1.4234247 | 0.1433361 | 0.5989574 | 2.1216478 | 2.2545290 | 1.2717457 | 1.1486673 | | | | | |
| 282 | 0.7756779 | 0.7756775 | 0.9799643 | 0.7160611 | 0.2328045 | -0.1789168 | -0.1235676 | 0.4117213 | 0.2128075 | 0.5077134 | 0.7853981 | 2.2900095 |
| | 1.4221087 | 0.1437174 | 0.5985336 | 2.1216555 | 2.2549047 | 1.2708921 | 1.1475391 | | | | | |
| 283 | 0.7748750 | 0.7748786 | 0.9795619 | 0.7151346 | 0.2324942 | -0.1800638 | -0.1243486 | 0.4125461 | 0.2132239 | 0.5076783 | 0.7853981 | 2.2848568 |
| | 1.4207516 | 0.1440989 | 0.5981095 | 2.1216631 | 2.2552824 | 1.2700377 | 1.1464100 | | | | | |
| 284 | 0.7740783 | 0.7740780 | 0.9791584 | 0.7142085 | 0.2321640 | -0.1812135 | -0.1251314 | 0.4133775 | 0.2136402 | 0.5076437 | 0.7853981 | 2.2797079 |
| | 1.4193813 | 0.1444801 | 0.5976857 | 2.1216717 | 2.2556601 | 1.2691832 | 1.1452789 | | | | | |
| 285 | 0.7732767 | 0.7732763 | 0.9787540 | 0.7132831 | 0.2318439 | -0.1823442 | -0.1259008 | 0.4141880 | 0.2140563 | 0.5076087 | 0.7853981 | 2.2746935 |
| | 1.4181490 | 0.1448613 | 0.5972617 | 2.1216793 | 2.2560425 | 1.2683277 | 1.1441467 | | | | | |
| 286 | 0.7724775 | 0.7724776 | 0.9783478 | 0.7123576 | 0.2315236 | -0.1834986 | -0.1266863 | 0.4150221 | 0.2144687 | 0.5075741 | 0.7853981 | 2.2695541 |
| | 1.4168325 | 0.1452420 | 0.5968302 | 2.1216869 | 2.2564173 | 1.2674723 | 1.1430178 | | | | | |
| 287 | 0.7716766 | 0.7716762 | 0.9779410 | 0.7114315 | 0.2312033 | -0.1846469 | -0.1274677 | 0.4158502 | 0.2148824 | 0.5075394 | 0.7853981 | 2.2644691 |
| | 1.4159111 | 0.1456231 | 0.5964141 | 2.1216946 | 2.2567949 | 1.2666140 | 1.1418858 | | | | | |
| 288 | 0.7708765 | 0.7708765 | 0.9775353 | 0.7105050 | 0.2308831 | -0.1857817 | -0.1282394 | 0.4166648 | 0.2152959 | 0.5075048 | 0.7853981 | 2.2594872 |
| | 1.4141893 | 0.1460053 | 0.5959899 | 2.1217041 | 2.2571774 | 1.2657595 | 1.1417557 | | | | | |
| 289 | 0.7700753 | 0.7700749 | 0.9771272 | 0.7095804 | 0.2305629 | -0.1869196 | -0.1290131 | 0.4174824 | 0.2157083 | 0.5074702 | 0.7853981 | 2.2545042 |
| | 1.4129656 | 0.1463866 | 0.5955645 | 2.1217127 | 2.2575579 | 1.2649021 | 1.1396227 | | | | | |
| 290 | 0.7692735 | 0.7692736 | 0.9767189 | 0.7086557 | 0.2302427 | -0.1880599 | -0.1297984 | 0.4183025 | 0.2161204 | 0.5074352 | 0.7853981 | 2.2495251 |
| | 1.4115446 | 0.1467682 | 0.5951397 | 2.1217203 | 2.2579374 | 1.2640457 | 1.1386907 | | | | | |
| 291 | 0.7684749 | 0.7684745 | 0.9763193 | 0.7077296 | 0.2299224 | -0.1892117 | -0.1305713 | 0.4191341 | 0.2165257 | 0.5074010 | 0.7853981 | 2.2444954 |
| | 1.4102240 | 0.1471496 | 0.5947151 | 2.1217289 | 2.2583161 | 1.2631965 | 1.1373615 | | | | | |
| 292 | 0.7676744 | 0.7676741 | 0.9759093 | 0.7069042 | 0.2296022 | -0.1903535 | -0.1313472 | 0.4199557 | 0.2169395 | 0.5073663 | 0.7853981 | 2.2395439 |
| | 1.4088931 | 0.1475314 | 0.5942898 | 2.1217384 | 2.2586927 | 1.2623291 | 1.1362314 | | | | | |
| 293 | 0.7668724 | 0.7668724 | 0.9754879 | 0.7059789 | 0.2292820 | -0.1914893 | -0.1321199 | 0.4207713 | 0.2173488 | 0.5073317 | 0.7853981 | 2.2346468 |
| | 1.4075785 | 0.1479133 | 0.5938645 | 2.1217461 | 2.2590742 | 1.2614708 | 1.1350585 | | | | | |
| 294 | 0.7660701 | 0.7660701 | 0.9750761 | 0.7049536 | 0.2289618 | -0.1926240 | -0.1328895 | 0.4215858 | 0.2177581 | 0.5072972 | 0.7853981 | 2.2297726 |
| | 1.4062519 | 0.1482952 | 0.5934391 | 2.1217556 | 2.2594566 | 1.2606115 | 1.1339645 | | | | | |
| 295 | 0.7652677 | 0.7652659 | 0.9746633 | 0.7040285 | 0.2286415 | -0.1937649 | -0.1336643 | 0.4224064 | 0.2181649 | 0.5072629 | 0.7853981 | 2.2248821 |
| | 1.4049282 | 0.1486771 | 0.5930136 | 2.1217651 | 2.2598362 | 1.2597523 | 1.1328344 | | | | | |
| 296 | 0.7644681 | 0.7644678 | 0.9742492 | 0.7031035 | 0.2283213 | -0.1948923 | -0.1344296 | 0.4232136 | 0.2185718 | 0.5072283 | 0.7853981 | 2.2200880 |
| | 1.4036001 | 0.1490588 | 0.5925880 | 2.1217747 | 2.2602196 | 1.2588921 | 1.1317035 | | | | | |
| 297 | 0.7636688 | 0.7636684 | 0.9738348 | 0.7021787 | 0.2280011 | -0.1960188 | -0.1352702 | 0.4240419 | 0.2189766 | 0.5071940 | 0.7853981 | 2.2151861 |
| | 1.4022785 | 0.1494411 | 0.5921620 | 2.1217842 | 2.2605972 | 1.2580318 | 1.1305714 | | | | | |
| 298 | 0.7628667 | 0.7628667 | 0.9734196 | 0.7012539 | 0.2276809 | -0.1971767 | -0.1359031 | 0.4248574 | 0.2193816 | 0.5071598 | 0.7853981 | 2.2103758 |
| | 1.4009522 | 0.1498229 | 0.5917362 | 2.1217937 | 2.2609777 | 1.2571707 | 1.1294384 | | | | | |
| 299 | 0.7620652 | 0.7620648 | 0.9730017 | 0.7003289 | 0.2273606 | -0.1983120 | -0.1367503 | 0.4256726 | 0.2197852 | 0.5071257 | 0.7853981 | 2.2055874 |
| | 1.3996256 | 0.1502044 | 0.5913104 | 2.1218033 | 2.2613583 | 1.2563086 | 1.1283064 | | | | | |
| 300 | 0.7612610 | 0.7612606 | 0.9725952 | 0.6994046 | 0.2270404 | -0.1994284 | -0.1375974 | 0.4264688 | 0.2201911 | 0.5070911 | 0.7853981 | 2.2009268 |
| | 1.3982944 | 0.1505866 | 0.5908843 | 2.1218128 | 2.2617355 | 1.2554474 | 1.1271696 | | | | | |
| 301 | 0.7604606 | 0.7604603 | 0.9721668 | 0.6984798 | 0.2267202 | -0.2005627 | -0.1382766 | 0.4272828 | 0.2205926 | 0.5070573 | 0.7853981 | 2.1961775 |
| | 1.3969660 | 0.1509690 | 0.5904577 | 2.1218243 | 2.2621279 | 1.2545853 | 1.1260366 | | | | | |
| 302 | 0.7596600 | 0.7596596 | 0.9717473 | 0.6975553 | 0.2264001 | -0.2017082 | -0.1390533 | 0.4280882 | 0.2209931 | 0.5070230 | 0.7853981 | 2.1913405 |
| | 1.3956413 | 0.1513509 | 0.5900316 | 2.1218338 | 2.2625055 | 1.2537222 | 1.1249035 | | | | | |
| 303 | 0.7588587 | 0.7588583 | 0.9713258 | 0.6966317 | 0.2260797 | -0.2028288 | -0.1398125 | 0.4288855 | 0.2213936 | 0.5069888 | 0.7853981 | 2.1867447 |
| | 1.3943100 | 0.1517322 | 0.5896057 | 2.1218443 | 2.2628899 | 1.2528582 | 1.1237726 | | | | | |
| 304 | 0.7580574 | 0.7580574 | 0.9709045 | 0.6957065 | 0.2257595 | -0.2039615 | -0.1405803 | 0.4297210 | 0.2217940 | 0.5069547 | 0.7853981 | 2.1820555 |
| | 1.3929806 | 0.1521142 | 0.5891792 | 2.1218538 | 2.2632713 | 1.2519932 | 1.1226387 | | | | | |
| 305 | 0.7572536 | 0.7572532 | 0.9704826 | 0.6947823 | 0.2254393 | -0.2050964 | -0.1413451 | 0.4305356 | 0.2221913 | 0.5069209 | 0.7853981 | 2.1773710 |
| | 1.3916521 | 0.1524962 | 0.5887526 | 2.1218653 | 2.2636528 | 1.2511292 | 1.1215476 | | | | | |
| 306 | 0.7564485 | 0.7564485 | 0.9700602 | 0.6938580 | 0.2251191 | -0.2062126 | -0.1421051 | 0.4313316 | 0.2225924 | 0.5068867 | 0.7853981 | 2.1728086 |
| | 1.3903175 | 0.1528790 | 0.5883251 | 2.1218758 | 2.2640400 | 1.2502651 | 1.1204709 | | | | | |
| 307 | 0.7556465 | 0.7556466 | 0.9696369 | 0.6929338 | 0.2247989 | -0.2073432 | -0.1428707 | 0.4321420 | 0.2229902 | 0.5068526 | 0.7853981 | 2.1681805 |
| | 1.3889885 | 0.1532615 | 0.5878978 | 2.1218863 | 2.2644224 | 1.2494001 | 1.1193379 | | | | | |
| 308 | 0.7548446 | 0.7548442 | 0.9692115 | 0.6920096 | 0.2244786 | -0.2084764 | -0.1436378 | 0.4329550 | 0.2233859 | 0.5068187 | 0.7853981 | 2.1635532 |
| | 1.3876581 | 0.1536435 | 0.5874709 | 2.1218967 | 2.2648039 | 1.2485342 | 1.1181949 | | | | | |
| 309 | 0.7540425 | 0.7540422 | 0.9687855 | 0.6910856 | 0.2241583 | -0.2095910 | -0.1443522 | 0.4337454 | 0.2237826 | 0.5067849 | 0.7853981 | 2.1590481 |
| | 1.3863211 | 0.1540257 | 0.5870437 | 2.1219082 | 2.2651911 | 1.2476673 | 1.1169682 | | | | | |
| 310 | 0.7532371 | 0.7532368 | 0.9683605 | 0.6901614 | 0.2238382 | -0.2107220 | -0.1451561 | 0.4345582 | 0.2241798 | 0.5067508 | 0.7853981 | 2.1544781 |
| | 1.3849888 | 0.1544086 | 0.5866156 | 2.1219196 | 2.2655745 | 1.2468004 | 1.1158333 | | | | | |
| 311 | 0.7524338 | 0.7524335 | 0.9679338 | 0.6892374 | 0.2235179 | -0.2118425 | -0.1459155 | 0.4353604 | 0.2245751 | 0.5067169 | 0.7853981 | 2.1499596 |
| | 1.3836546 | 0.1547917 | 0.5861873 | 2.1219311 | 2.2659597 | 1.2459335 | 1.1146884 | | | | | |
| 312 | 0.7516285 | 0.7516285 | 0.9675068 | 0.6883132 | 0.2231977 | -0.2129525 | -0.1466662 | 0.4361502 | 0.2249714 | 0.5066831 | 0.7853981 | 2.1455269 |
| | 1.3823166 | 0.1551749 | 0.5857588 | 2.1219425 | 2.2663488 | 1.2450676 | 1.1135607 | | | | | |
| 313 | 0.7508254 | 0.7508251 | 0.9670780 | 0.6873896 | 0.2228774 | -0.2140735 | -0.1474240 | 0.4369510 | 0.2253647 | 0.5066494 | 0.7853981 | 2.1410465 |
| | 1.3809824 | 0.1555578 | 0.5853305 | 2.1219540 | 2.2667341 | 1.2441998 | 1.1124258 | | | | | |
| 314 | 0.7500228 | 0.7500221 | 0.9666485 | 0.6864656 | 0.2225572 | -0.2151905 | -0.1481860 | 0.4377578 | 0.2257571 | 0.5066156 | 0.7853981 | 2.1365490 |
| | 1.3796482 | 0.1559406 | 0.5849022 | 2.1219664 | 2.2671175 | 1.2433319 | 1.1112919 | | | | | |
| 315 | 0.7492183 | 0.7492181 | 0.9662186 | 0.6855417 | 0.2222370 | -0.2163046 | -0.1488388 | 0.4385515 | 0.2261499 | 0.5065818 | 0.7853981 | 2.1321402 |
| | 1.3783112 | 0.1563239 | 0.5844734 | 2.1219778 | 2.2675056 | 1.2424631 | 1.1101551 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 316 | 0.7484145 | 0.7484146 | 0.9657865 | 0.6846191 | 0.2219168 | -0.2174371 | -0.1496972 | 0.4393539 | 0.2265409 | 0.5065685 | 0.7853981 | 2.1276979 |
| | 1.3769741 | 0.1567066 | 0.5840449 | 2.1219502 | 2.2678900 | 1.2415924 | 1.1099202 | | | | | |
| 317 | 0.7476112 | 0.7476110 | 0.9653551 | 0.6836543 | 0.2215965 | -0.2185563 | -0.1504533 | 0.4401528 | 0.2269310 | 0.5065146 | 0.7853981 | 2.1232991 |
| | 1.3756390 | 0.1570904 | 0.5836153 | 2.1220026 | 2.2682772 | 1.2407246 | 1.1078854 | | | | | |
| 318 | 0.7468067 | 0.7468064 | 0.9649224 | 0.6827709 | 0.2212763 | -0.2196746 | -0.1512085 | 0.4409510 | 0.2273214 | 0.5064809 | 0.7853981 | 2.1189003 |
| | 1.3743010 | 0.1574736 | 0.5831862 | 2.1220140 | 2.2686625 | 1.2398539 | 1.1057486 | | | | | |
| 319 | 0.7460027 | 0.7460023 | 0.9644875 | 0.6818473 | 0.2209561 | -0.2207925 | -0.1519632 | 0.4417486 | 0.2277092 | 0.5064475 | 0.7853981 | 2.1145287 |
| | 1.3729630 | 0.1578564 | 0.5827573 | 2.1220264 | 2.2690487 | 1.2389822 | 1.1036128 | | | | | |
| 320 | 0.7451551 | 0.7451588 | 0.9640531 | 0.6809238 | 0.2206359 | -0.2219111 | -0.1527177 | 0.4425460 | 0.2280971 | 0.5064142 | 0.7853981 | 2.1101732 |
| | 1.3716240 | 0.1582402 | 0.5823274 | 2.1220388 | 2.2694359 | 1.2381115 | 1.1014769 | | | | | |
| 321 | 0.7443544 | 0.7443541 | 0.9636172 | 0.6800005 | 0.2203156 | -0.2230208 | -0.1534671 | 0.4433364 | 0.2284845 | 0.5063804 | 0.7853981 | 2.1058702 |
| | 1.3702850 | 0.1586236 | 0.5818979 | 2.1220522 | 2.2698240 | 1.2372408 | 1.0993401 | | | | | |
| 322 | 0.7435008 | 0.7435005 | 0.9631796 | 0.6790773 | 0.2199954 | -0.2241407 | -0.1542281 | 0.4441441 | 0.2288693 | 0.5063470 | 0.7853981 | 2.1014881 |
| | 1.3689460 | 0.1590065 | 0.5814686 | 2.1220646 | 2.2702174 | 1.2363672 | 1.0972053 | | | | | |
| 323 | 0.7427843 | 0.7427843 | 0.9627418 | 0.6781535 | 0.2196752 | -0.2252465 | -0.1549685 | 0.4449217 | 0.2292558 | 0.5063137 | 0.7853981 | 2.0972834 |
| | 1.3676033 | 0.1593901 | 0.5810387 | 2.1220779 | 2.2705994 | 1.2354946 | 1.0950656 | | | | | |
| 324 | 0.7419811 | 0.7419808 | 0.9623035 | 0.6772307 | 0.2193551 | -0.2263674 | -0.1557243 | 0.4457223 | 0.2296399 | 0.5062803 | 0.7853981 | 2.0929689 |
| | 1.3662643 | 0.1597736 | 0.5806086 | 2.1220913 | 2.2709846 | 1.2346210 | 1.0929308 | | | | | |
| 325 | 0.7411725 | 0.7411725 | 0.9618637 | 0.6763074 | 0.2190347 | -0.2274644 | -0.1564639 | 0.4464991 | 0.2300259 | 0.5062469 | 0.7853981 | 2.0887557 |
| | 1.3649166 | 0.1601571 | 0.5801784 | 2.1221046 | 2.2713776 | 1.2337475 | 1.0907892 | | | | | |
| 326 | 0.7403667 | 0.7403663 | 0.9614241 | 0.6753841 | 0.2187145 | -0.2285724 | -0.1572106 | 0.4472869 | 0.2304106 | 0.5062136 | 0.7853981 | 2.0845776 |
| | 1.3635731 | 0.1605411 | 0.5797476 | 2.1221180 | 2.2717676 | 1.2328739 | 1.0886496 | | | | | |
| 327 | 0.7395633 | 0.7395630 | 0.9609832 | 0.6744610 | 0.2183943 | -0.2296884 | -0.1579626 | 0.4480827 | 0.2307922 | 0.5061802 | 0.7853981 | 2.0803318 |
| | 1.3622332 | 0.1609253 | 0.5793166 | 2.1221313 | 2.2721548 | 1.2319994 | 1.0865147 | | | | | |
| 328 | 0.7387567 | 0.7387563 | 0.9605406 | 0.6735380 | 0.2180741 | -0.2307951 | -0.1587081 | 0.4488692 | 0.2311743 | 0.5061469 | 0.7853981 | 2.0761480 |
| | 1.3608988 | 0.1613089 | 0.5788860 | 2.1221447 | 2.2725449 | 1.2311239 | 1.0843751 | | | | | |
| 329 | 0.7379453 | 0.7379489 | 0.9600981 | 0.6726148 | 0.2177538 | -0.2318980 | -0.1594507 | 0.4496518 | 0.2315570 | 0.5061135 | 0.7853981 | 2.0719986 |
| | 1.3595619 | 0.1616932 | 0.5784546 | 2.1221580 | 2.2729359 | 1.2302485 | 1.0822345 | | | | | |
| 330 | 0.7371447 | 0.7371444 | 0.9596540 | 0.6716920 | 0.2174336 | -0.2330039 | -0.1601953 | 0.4504375 | 0.2319362 | 0.5060806 | 0.7853981 | 2.0678463 |
| | 1.3581577 | 0.1620770 | 0.5780237 | 2.1221713 | 2.2733259 | 1.2293720 | 1.0800977 | | | | | |
| 331 | 0.7363368 | 0.7363364 | 0.9592102 | 0.6707688 | 0.2171134 | -0.2340999 | -0.1609329 | 0.4512132 | 0.2323180 | 0.5060472 | 0.7853981 | 2.0637598 |
| | 1.3568487 | 0.1624618 | 0.5775915 | 2.1221876 | 2.2737198 | 1.2284966 | 1.0779561 | | | | | |
| 332 | 0.7355320 | 0.7355316 | 0.9587634 | 0.6699462 | 0.2167932 | -0.2352194 | -0.1616865 | 0.4520126 | 0.2326947 | 0.5060143 | 0.7853981 | 2.0595627 |
| | 1.3555055 | 0.1628452 | 0.5771608 | 2.1222010 | 2.2741051 | 1.2276182 | 1.0758194 | | | | | |
| 333 | 0.7347261 | 0.7347264 | 0.9583170 | 0.6690232 | 0.2164729 | -0.2363262 | -0.1624311 | 0.4527991 | 0.2330722 | 0.5059813 | 0.7853981 | 2.0554466 |
| | 1.3541602 | 0.1632296 | 0.5767280 | 2.1222153 | 2.2744942 | 1.2267399 | 1.0736816 | | | | | |
| 334 | 0.7339198 | 0.7339192 | 0.9578699 | 0.6680995 | 0.2161527 | -0.2374234 | -0.1631689 | 0.4535761 | 0.2334502 | 0.5059484 | 0.7853981 | 2.0513945 |
| | 1.3528116 | 0.1636140 | 0.5762965 | 2.1222315 | 2.2748871 | 1.2258625 | 1.0715421 | | | | | |
| 335 | 0.7331115 | 0.7331115 | 0.9574214 | 0.6671776 | 0.2158325 | -0.2385201 | -0.1639063 | 0.4543526 | 0.2338274 | 0.5059150 | 0.7853981 | 2.0473566 |
| | 1.3514624 | 0.1639987 | 0.5758646 | 2.1222448 | 2.2752810 | 1.2249842 | 1.0694004 | | | | | |
| 336 | 0.7323043 | 0.7323039 | 0.9569727 | 0.6661547 | 0.2155123 | -0.2396221 | -0.1646471 | 0.4551344 | 0.2342042 | 0.5058820 | 0.7853981 | 2.0433035 |
| | 1.3501133 | 0.1643834 | 0.5754320 | 2.1222591 | 2.2756720 | 1.2241049 | 1.0672598 | | | | | |
| 337 | 0.7314956 | 0.7314954 | 0.9565224 | 0.6652321 | 0.2151920 | -0.2407327 | -0.1653935 | 0.4559247 | 0.2345774 | 0.5058495 | 0.7853981 | 2.0392208 |
| | 1.3487673 | 0.1647680 | 0.5749995 | 2.1222744 | 2.2760611 | 1.2232256 | 1.0651231 | | | | | |
| 338 | 0.7305221 | 0.7305217 | 0.9560715 | 0.6643096 | 0.2148718 | -0.2418533 | -0.1660928 | 0.4566251 | 0.2350672 | 0.5058097 | 0.7853981 | 2.0392179 |
| | 1.3471327 | 0.1651425 | 0.5745669 | 2.1222925 | 2.2767019 | 1.2223454 | 1.0837421 | | | | | |
| 339 | 0.7298765 | 0.7298761 | 0.9556212 | 0.6633866 | 0.2145516 | -0.2428896 | -0.1668423 | 0.4574412 | 0.2353328 | 0.5057833 | 0.7853981 | 2.0314217 |
| | 1.3460522 | 0.1655379 | 0.5741329 | 2.1223059 | 2.2768602 | 1.2214661 | 1.0828295 | | | | | |
| 340 | 0.7289062 | 0.7289058 | 0.9551686 | 0.6624639 | 0.2142314 | -0.2432481 | -0.1670771 | 0.4574795 | 0.2358161 | 0.5057439 | 0.7853981 | 2.0312262 |
| | 1.3444256 | 0.1659136 | 0.5736992 | 2.1223240 | 2.2774897 | 1.2205849 | 1.0814590 | | | | | |
| 341 | 0.7282602 | 0.7282598 | 0.9547161 | 0.6615409 | 0.2139111 | -0.2451764 | -0.1683105 | 0.4589875 | 0.2360759 | 0.5057174 | 0.7853981 | 2.0235186 |
| | 1.3433477 | 0.1663080 | 0.5732653 | 2.1223364 | 2.2776489 | 1.2197037 | 1.0805464 | | | | | |
| 342 | 0.7272871 | 0.7272868 | 0.9542620 | 0.6606195 | 0.2135909 | -0.2454256 | -0.1685388 | 0.4590166 | 0.2365634 | 0.5056780 | 0.7853981 | 2.0233707 |
| | 1.3417206 | 0.1666843 | 0.5728315 | 2.1223545 | 2.2782822 | 1.2139225 | 1.0791721 | | | | | |
| 343 | 0.7264770 | 0.7264767 | 0.9538067 | 0.6596957 | 0.2132707 | -0.2465033 | -0.1692659 | 0.4597799 | 0.2369356 | 0.5056454 | 0.7853981 | 2.0194883 |
| | 1.3403618 | 0.1670698 | 0.5723972 | 2.1223717 | 2.2786808 | 1.2179394 | 1.0780277 | | | | | |
| 344 | 0.7256668 | 0.7256663 | 0.9533514 | 0.6587733 | 0.2129505 | -0.2475053 | -0.1699946 | 0.4605458 | 0.2373079 | 0.5056125 | 0.7853981 | 2.0156059 |
| | 1.3390045 | 0.1674552 | 0.5719630 | 2.1223879 | 2.2790775 | 1.2170572 | 1.0768824 | | | | | |
| 345 | 0.7248566 | 0.7248566 | 0.9528949 | 0.6578505 | 0.2126302 | -0.2486774 | -0.1707292 | 0.4613178 | 0.2376786 | 0.5055799 | 0.7853981 | 2.0117540 |
| | 1.2376474 | 0.1678414 | 0.5715278 | 2.1224041 | 2.2794762 | 1.2161741 | 1.0757389 | | | | | |
| 346 | 0.7240476 | 0.7240472 | 0.9524381 | 0.6569279 | 0.2123100 | -0.2497742 | -0.1714558 | 0.4620842 | 0.2380488 | 0.5055470 | 0.7853981 | 2.0078402 |
| | 1.2362923 | 0.1682276 | 0.5710926 | 2.1224194 | 2.2798710 | 1.2152910 | 1.0745955 | | | | | |
| 347 | 0.7232378 | 0.7232374 | 0.9519813 | 0.6560052 | 0.2119898 | -0.2508564 | -0.1721905 | 0.4628451 | 0.2384194 | 0.5055146 | 0.7853981 | 2.0040178 |
| | 1.2349342 | 0.1686144 | 0.5706566 | 2.1224365 | 2.2802706 | 1.2144179 | 1.0734510 | | | | | |
| 348 | 0.7224275 | 0.7224275 | 0.9515221 | 0.6550825 | 0.2116696 | -0.2519430 | -0.1729187 | 0.4636115 | 0.2387876 | 0.5054820 | 0.7853981 | 2.0001793 |
| | 1.2335752 | 0.1690003 | 0.5702215 | 2.1224537 | 2.2806673 | 1.2135225 | 1.0723066 | | | | | |
| 349 | 0.7216182 | 0.7216178 | 0.9510630 | 0.6541598 | 0.2113493 | -0.2530220 | -0.1736322 | 0.4643713 | 0.2391559 | 0.5054494 | 0.7853981 | 1.9963865 |
| | 1.2322176 | 0.1693872 | 0.5697852 | 2.1224659 | 2.2810664 | 1.2126389 | 1.0711532 | | | | | |
| 350 | 0.7208085 | 0.7208081 | 0.9506032 | 0.6532371 | 0.2110291 | -0.2541105 | -0.1743614 | 0.4651396 | 0.2395234 | 0.5054169 | 0.7853981 | 1.9925613 |
| | 1.2308601 | 0.1697744 | 0.5693486 | 2.1224871 | 2.2814646 | 1.2117548 | 1.0700197 | | | | | |
| 351 | 0.7199989 | 0.7199979 | 0.9501423 | 0.6523143 | 0.2107089 | -0.2551950 | -0.1750875 | 0.4659038 | 0.2398902 | 0.5053844 | 0.7853981 | 1.9887695 |
| | 1.2295052 | 0.1701611 | 0.5689123 | 2.1225042 | 2.2818632 | 1.2108679 | 1.0688744 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 352 | 0.7191888 | 0.7151882 | 0.9496808 | 0.6513518 | 0.2103887 | -1.2562852 | -0.1758175 | 0.4666739 | 0.2402562 | 0.5053520 | 0.7853981 | 1.9849596 |
| | 1.3281422 | 0.1705482 | 0.5684755 | 2.1225204 | 2.2827590 | 1.2099829 | 1.0677309 | | | | | |
| 353 | 0.7183775 | 0.7183772 | 0.9492171 | 0.6514690 | 0.2100684 | -0.2573663 | -0.1765409 | 0.4674344 | 0.2406210 | 0.5053198 | 0.7853981 | 1.9812078 |
| | 1.3267794 | 0.1709352 | 0.5680396 | 2.1225395 | 2.2826595 | 1.2090950 | 1.0665855 | | | | | |
| 354 | 0.7175642 | 0.7175638 | 0.9487553 | 0.6495464 | 0.2097482 | -0.2584285 | -0.1772517 | 0.4681767 | 0.2409850 | 0.5052873 | 0.7853981 | 1.9775572 |
| | 1.3254128 | 0.1713234 | 0.5676005 | 2.1225567 | 2.2825658 | 1.2082109 | 1.0654364 | | | | | |
| 355 | 0.7167560 | 0.7167557 | 0.9482910 | 0.6496276 | 0.2094280 | -0.2595355 | -0.1779855 | 0.4689535 | 0.2413512 | 0.5052547 | 0.7853981 | 1.9737482 |
| | 1.3240566 | 0.1717110 | 0.5671628 | 2.1225748 | 2.2824606 | 1.2073221 | 1.0642948 | | | | | |
| 356 | 0.7159441 | 0.7159438 | 0.9478261 | 0.6477012 | 0.2091078 | -0.2606316 | -0.1787052 | 0.4697094 | 0.2417153 | 0.5052226 | 0.7853981 | 1.9700527 |
| | 1.3226915 | 0.1720989 | 0.5667248 | 2.1225920 | 2.2823631 | 1.2064352 | 1.0631475 | | | | | |
| 357 | 0.7151315 | 0.7151311 | 0.9473595 | 0.6467787 | 0.2087875 | -0.2616713 | -0.1794203 | 0.4704588 | 0.2420787 | 0.5051901 | 0.7853981 | 1.9664011 |
| | 1.3213253 | 0.1724865 | 0.5662869 | 2.1226101 | 2.2822665 | 1.2055464 | 1.0619993 | | | | | |
| 358 | 0.7143208 | 0.7143204 | 0.9468918 | 0.6459560 | 0.2084673 | -0.2627518 | -0.1801424 | 0.4712191 | 0.2424350 | 0.5051580 | 0.7853981 | 1.9627766 |
| | 1.3199625 | 0.1728739 | 0.5658490 | 2.1226282 | 2.2821661 | 1.2046565 | 1.0608540 | | | | | |
| 359 | 0.7135051 | 0.7135088 | 0.9464245 | 0.6449335 | 0.2081470 | -0.2638318 | -0.1808640 | 0.4719788 | 0.2428006 | 0.5051259 | 0.7853981 | 1.9590254 |
| | 1.3185987 | 0.1732621 | 0.5654102 | 2.1226463 | 2.2820666 | 1.2037668 | 1.0597076 | | | | | |
| 360 | 0.7126966 | 0.7126963 | 0.9459548 | 0.6440114 | 0.2078269 | -0.2649053 | -0.1815811 | 0.4727322 | 0.2431605 | 0.5050935 | 0.7853981 | 1.9553862 |
| | 1.3172321 | 0.1736494 | 0.5649723 | 2.1226645 | 2.2819681 | 1.2028761 | 1.0585594 | | | | | |
| 361 | 0.7118928 | 0.7118825 | 0.9454854 | 0.6431806 | 0.2075066 | -0.2659699 | -0.1822921 | 0.4734765 | 0.2435216 | 0.5050616 | 0.7853981 | 1.9518013 |
| | 1.3158627 | 0.1740379 | 0.5645329 | 2.1226835 | 2.2818744 | 1.2019863 | 1.0574107 | | | | | |
| 362 | 0.7110716 | 0.7110713 | 0.9450147 | 0.6421661 | 0.2071864 | -0.2670446 | -0.1830094 | 0.4742319 | 0.2438797 | 0.5050296 | 0.7853981 | 1.9481773 |
| | 1.3144970 | 0.1744265 | 0.5640935 | 2.1227026 | 2.2817808 | 1.2010956 | 1.0562639 | | | | | |
| 363 | 0.7102598 | 0.7102595 | 0.9445422 | 0.6412436 | 0.2068661 | -0.2681260 | -0.1837314 | 0.4749922 | 0.2442364 | 0.5049974 | 0.7853981 | 1.9445333 |
| | 1.3131312 | 0.1748143 | 0.5636547 | 2.1227217 | 2.2816864 | 1.2002129 | 1.0551176 | | | | | |
| 364 | 0.7094488 | 0.7094483 | 0.9440710 | 0.6403212 | 0.2065455 | -0.2691998 | -0.1844579 | 0.4757458 | 0.2445940 | 0.5049653 | 0.7853981 | 1.9409351 |
| | 1.3117657 | 0.1752034 | 0.5632144 | 2.1227407 | 2.2815909 | 1.1993122 | 1.0539713 | | | | | |
| 365 | 0.7086334 | 0.7086331 | 0.9435970 | 0.6393985 | 0.2062257 | -0.2702649 | -0.1851583 | 0.4764906 | 0.2449516 | 0.5049332 | 0.7853981 | 1.9373894 |
| | 1.3103932 | 0.1755911 | 0.5627746 | 2.1227598 | 2.2814951 | 1.1984186 | 1.0528202 | | | | | |
| 366 | 0.7078195 | 0.7078195 | 0.9431236 | 0.6384760 | 0.2059055 | -0.2713291 | -0.1858680 | 0.4772346 | 0.2453088 | 0.5049012 | 0.7853981 | 1.9338579 |
| | 1.3090215 | 0.1759813 | 0.5623338 | 2.1227789 | 2.2813914 | 1.1975269 | 1.0516761 | | | | | |
| 367 | 0.7070071 | 0.7070068 | 0.9426492 | 0.6375534 | 0.2055852 | -0.2724016 | -0.1865831 | 0.4779869 | 0.2456644 | 0.5048695 | 0.7853981 | 1.9302979 |
| | 1.3076534 | 0.1763704 | 0.5618931 | 2.1227980 | 2.2812948 | 1.1966333 | 1.0505228 | | | | | |
| 368 | 0.7061945 | 0.7061942 | 0.9421738 | 0.6366311 | 0.2052651 | -0.2734736 | -0.1872956 | 0.4787356 | 0.2460188 | 0.5048373 | 0.7853981 | 1.9267635 |
| | 1.3062846 | 0.1767600 | 0.5614520 | 2.1228199 | 2.2811992 | 1.1957397 | 1.0493746 | | | | | |
| 369 | 0.7053798 | 0.7053795 | 0.9416968 | 0.6357086 | 0.2049448 | -0.2745332 | -0.1880036 | 0.4794779 | 0.2463732 | 0.5048056 | 0.7853981 | 1.9232712 |
| | 1.3049097 | 0.1771492 | 0.5610110 | 2.1228390 | 2.2811064 | 1.1948452 | 1.0482235 | | | | | |
| 370 | 0.7045653 | 0.7045650 | 0.9412189 | 0.6347861 | 0.2046246 | -0.2756007 | -0.1887147 | 0.4802253 | 0.2467266 | 0.5047739 | 0.7853981 | 1.9197636 |
| | 1.3035374 | 0.1775382 | 0.5605701 | 2.1228580 | 2.2810107 | 1.1939487 | 1.0470734 | | | | | |
| 371 | 0.7037512 | 0.7037510 | 0.9407392 | 0.6338637 | 0.2043043 | -0.2766675 | -0.1894251 | 0.4809719 | 0.2470778 | 0.5047418 | 0.7853981 | 1.9162712 |
| | 1.3021650 | 0.1779271 | 0.5601290 | 2.1228770 | 2.2809161 | 1.1930523 | 1.0459232 | | | | | |
| 372 | 0.7029385 | 0.7029386 | 0.9402600 | 0.6329414 | 0.2039841 | -0.2777332 | -0.1901414 | 0.4817274 | 0.2474286 | 0.5047101 | 0.7853981 | 1.9127464 |
| | 1.3007956 | 0.1783170 | 1.5596870 | 2.1228991 | 2.2808185 | 1.1921560 | 1.0447760 | | | | | |
| 373 | 0.7021235 | 0.7021236 | 0.9397751 | 0.6320189 | 0.2036639 | -0.2788036 | -0.1908472 | 0.4824675 | 0.2477795 | 0.5046784 | 0.7853981 | 1.9093037 |
| | 1.2994194 | 0.1787068 | 0.5592449 | 2.1229191 | 2.2807267 | 1.1912603 | 1.0436239 | | | | | |
| 374 | 0.7013096 | 0.7013093 | 0.9392987 | 0.6310962 | 0.2033437 | -0.2798657 | -0.1915538 | 0.4832094 | 0.2481304 | 0.5046467 | 0.7853981 | 1.9058619 |
| | 1.2980442 | 0.1790972 | 0.5588021 | 2.1229401 | 2.2806311 | 1.1903629 | 1.0424738 | | | | | |
| 375 | 0.7004946 | 0.7004945 | 0.9389177 | 0.6301737 | 0.2030234 | -0.2809247 | -0.1922583 | 0.4839482 | 0.2484810 | 0.5046150 | 0.7853981 | 1.9024448 |
| | 1.2966950 | 0.1794881 | 0.5583588 | 2.1229610 | 2.2805430 | 1.1894665 | 1.0413227 | | | | | |
| 376 | 0.6996778 | 0.6996775 | 0.9383342 | 0.6292513 | 0.2027032 | -0.2819769 | -0.1929579 | 0.4846802 | 0.2488307 | 0.5045833 | 0.7853981 | 1.8990679 |
| | 1.2952856 | 0.1798780 | 0.5579161 | 2.1229820 | 2.2804531 | 1.1885681 | 1.0401688 | | | | | |
| 377 | 0.6988631 | 0.6988628 | 0.9378502 | 0.6283286 | 0.2023830 | -0.2830436 | -0.1936671 | 0.4854265 | 0.2491785 | 0.5045516 | 0.7853981 | 1.8956337 |
| | 1.2939148 | 0.1802693 | 0.5574729 | 2.1230030 | 2.2803594 | 1.1876688 | 1.0390186 | | | | | |
| 378 | 0.6980482 | 0.6980480 | 0.9373655 | 0.6274064 | 0.2021628 | -0.2841964 | -0.1943735 | 0.4861692 | 0.2495248 | 0.5045203 | 0.7853981 | 1.8922272 |
| | 1.2925388 | 0.1806589 | 0.5570295 | 2.1230245 | 2.2802666 | 1.1867695 | 1.0378685 | | | | | |
| 379 | 0.6972315 | 0.6972316 | 0.9368790 | 0.6264840 | 0.2018425 | -0.2852573 | -0.1950716 | 0.4868958 | 0.2498719 | 0.5044886 | 0.7853981 | 1.8888055 |
| | 1.2911577 | 0.1810491 | 0.5565861 | 2.1230455 | 2.2801776 | 1.1858692 | 1.0367136 | | | | | |
| 380 | 0.6964178 | 0.6964173 | 0.9363978 | 0.6255616 | 0.2014223 | -0.2862215 | -0.1957785 | 0.4876438 | 0.2502178 | 0.5044574 | 0.7853981 | 1.8854523 |
| | 1.2897816 | 0.1814405 | 0.5561416 | 2.1230679 | 2.2800848 | 1.1849699 | 1.0355635 | | | | | |
| 381 | 0.6956015 | 0.6956016 | 0.9359055 | 0.6246386 | 0.2011021 | -0.2872801 | -0.1964815 | 0.4883822 | 0.2505627 | 0.5044257 | 0.7853981 | 1.8821335 |
| | 1.2884026 | 0.1818316 | 0.5556973 | 2.1230898 | 2.2799939 | 1.1840687 | 1.0344114 | | | | | |
| 382 | 0.6947846 | 0.6947843 | 0.9354100 | 0.6237165 | 0.2007819 | -0.2883257 | -0.1971754 | 0.4891075 | 0.2509084 | 0.5043944 | 0.7853981 | 1.8788433 |
| | 1.2870197 | 0.1822229 | 0.5552524 | 2.1231117 | 2.2799069 | 1.1831675 | 1.0332565 | | | | | |
| 383 | 0.6939677 | 0.6939674 | 0.9349272 | 0.6227939 | 0.2004616 | -0.2893831 | -0.1978773 | 0.4898447 | 0.2512511 | 0.5043627 | 0.7853981 | 1.8755083 |
| | 1.2856388 | 0.1826135 | 0.5548083 | 2.1231337 | 2.2798160 | 1.1822643 | 1.0321926 | | | | | |
| 384 | 0.6931516 | 0.6931513 | 0.9344375 | 0.6218713 | 0.2001414 | -0.2904395 | -0.1985782 | 0.4905809 | 0.2515947 | 0.5043314 | 0.7853981 | 1.8721667 |
| | 1.2842575 | 0.1830053 | 0.5543627 | 2.1231565 | 2.2797261 | 1.1813622 | 1.0309565 | | | | | |
| 385 | 0.6923334 | 0.6923331 | 0.9339473 | 0.6209484 | 0.1998212 | -0.2914867 | -0.1992728 | 0.4913079 | 0.2519386 | 0.5043001 | 0.7853981 | 1.8685165 |
| | 1.2828741 | 0.1833976 | 0.5539165 | 2.1231785 | 2.2796401 | 1.1804600 | 1.0297947 | | | | | |
| 386 | 0.6915168 | 0.6915165 | 0.9334557 | 0.6200256 | 0.1995009 | -0.2925363 | -0.1999688 | 0.4920372 | 0.2522804 | 0.5042688 | 0.7853981 | 1.8656435 |
| | 1.2814903 | 0.1837894 | 0.5534707 | 2.1232023 | 2.2795520 | 1.1795559 | 1.0286407 | | | | | |
| 387 | 0.6906999 | 0.6906996 | 0.9329637 | 0.6191033 | 0.1991807 | -0.2935909 | -0.2006673 | 0.4927716 | 0.2526218 | 0.5042376 | 0.7853981 | 1.8623581 |
| | 1.2801065 | 0.1841816 | 0.5530244 | 2.1232243 | 2.2794633 | 1.1786528 | 1.0274968 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 388 | 0.6898836 | 0.6898827 | 0.9324705 | 0.6181803 | 0.1988605 | -0.2946449 | -0.2013663 | 0.4935054 | 0.2529622 | 0.5042062 | 0.7853981 | 1.8590841 |
| | 1.2787247 | 0.1845743 | 0.5525774 | 2.1232471 | 2.2968750 | 1.1777487 | 1.0263329 | | | | | |
| 389 | 0.6890662 | 0.6890659 | 0.9319755 | 0.6172580 | 0.1985403 | -0.2956954 | -0.2020623 | 0.4942357 | 0.2533007 | 0.5041749 | 0.7853981 | 1.8558340 |
| | 1.2773405 | 0.1845664 | 0.5521311 | 2.1232709 | 2.2972879 | 1.1768436 | 1.0251789 | | | | | |
| 390 | 0.6882466 | 0.6882465 | 0.9314814 | 0.6163349 | 0.1982209 | -0.2967398 | -0.2027540 | 0.4949598 | 0.2536420 | 0.5041441 | 0.7853981 | 1.8526201 |
| | 1.2759514 | 0.1853558 | 0.5516830 | 2.1232548 | 2.2977028 | 1.1759386 | 1.0240221 | | | | | |
| 391 | 0.6874251 | 0.6874254 | 0.9309849 | 0.6154126 | 0.1978993 | -0.2977889 | -0.2034486 | 0.4956887 | 0.2539754 | 0.5041128 | 0.7853981 | 1.8493938 |
| | 1.2745676 | 0.1857520 | 0.5512363 | 2.1233177 | 2.2981148 | 1.1750326 | 1.0228672 | | | | | |
| 392 | 0.6866111 | 0.6866108 | 0.9304863 | 0.6144991 | 0.1975796 | -0.2988346 | -0.2041407 | 0.4964142 | 0.2543157 | 0.5040818 | 0.7853981 | 1.8461914 |
| | 1.2731751 | 0.1861439 | 0.5507895 | 2.1233416 | 2.2985287 | 1.1741247 | 1.0217113 | | | | | |
| 393 | 0.6857924 | 0.6857921 | 0.9299872 | 0.6135674 | 0.1972594 | -0.2998831 | -0.2048346 | 0.4971425 | 0.2546517 | 0.5040507 | 0.7853981 | 1.8429852 |
| | 1.2717515 | 0.1865369 | 0.5503415 | 2.1233654 | 2.2989436 | 1.1732178 | 1.0205545 | | | | | |
| 394 | 0.6849737 | 0.6849734 | 0.9294882 | 0.6126447 | 0.1969391 | -0.3009308 | -0.2055277 | 0.4978699 | 0.2549877 | 0.5040193 | 0.7853981 | 1.8397513 |
| | 1.2704048 | 0.1869300 | 0.5498933 | 2.1233892 | 2.2993565 | 1.1723099 | 1.0193787 | | | | | |
| 395 | 0.6841541 | 0.6841538 | 0.9289888 | 0.6117218 | 0.1965189 | -0.3019657 | -0.2062119 | 0.4985846 | 0.2553241 | 0.5039885 | 0.7853981 | 1.8366613 |
| | 1.2690134 | 0.1873237 | 0.5494443 | 2.1234140 | 2.2997742 | 1.1714020 | 1.0182400 | | | | | |
| 396 | 0.6833344 | 0.6833341 | 0.9284885 | 0.6107990 | 0.1962987 | -0.3030066 | -0.2069301 | 0.4993052 | 0.2556596 | 0.5039576 | 0.7853981 | 1.8335142 |
| | 1.2676210 | 0.1877175 | 0.5489952 | 2.1234379 | 2.3001909 | 1.1704931 | 1.0170822 | | | | | |
| 397 | 0.6825179 | 0.6825172 | 0.9279868 | 0.6098763 | 0.1959785 | -0.3040578 | -0.2075949 | 0.5000362 | 0.2559919 | 0.5039267 | 0.7853981 | 1.8303259 |
| | 1.2662354 | 0.1881112 | 0.5485461 | 2.1234627 | 2.3006039 | 1.1695843 | 1.0159283 | | | | | |
| 398 | 0.6816967 | 0.6816964 | 0.9274840 | 0.6089533 | 0.1956582 | -0.3051033 | -0.2082837 | 0.5007585 | 0.2563258 | 0.5038958 | 0.7853981 | 1.8271514 |
| | 1.2648426 | 0.1885051 | 0.5480965 | 2.1234875 | 2.3011206 | 1.1686735 | 1.0147696 | | | | | |
| 399 | 0.6808774 | 0.6808771 | 0.9269810 | 0.6080304 | 0.1953393 | -0.3061391 | -0.2089699 | 0.5014771 | 0.2566584 | 0.5038649 | 0.7853981 | 1.8240786 |
| | 1.2634506 | 0.1888994 | 0.5476464 | 2.1235123 | 2.3014383 | 1.1677637 | 1.0136118 | | | | | |
| 400 | 0.6800562 | 0.6800560 | 0.9264773 | 0.6071075 | 0.1951178 | -0.3071772 | -0.2096554 | 0.5021950 | 0.2569917 | 0.5038341 | 0.7853981 | 1.8209753 |
| | 1.2620564 | 0.1892939 | 0.5471955 | 2.1235371 | 2.3018560 | 1.1668530 | 1.0124521 | | | | | |
| 401 | 0.6792362 | 0.6792359 | 0.9259713 | 0.6061845 | 0.1946976 | -0.3082116 | -0.2103381 | 0.5029091 | 0.2573225 | 0.5038032 | 0.7853981 | 1.8178578 |
| | 1.2606630 | 0.1896882 | 0.5467455 | 2.1235619 | 2.3022747 | 1.1659412 | 1.0112934 | | | | | |
| 402 | 0.6784156 | 0.6784153 | 0.9254649 | 0.6052617 | 0.1943773 | -0.3092575 | -0.2110285 | 0.5036348 | 0.2576525 | 0.5037723 | 0.7853981 | 1.8147774 |
| | 1.2592697 | 0.1900825 | 0.5462950 | 2.1235876 | 2.3026905 | 1.1650286 | 1.0101347 | | | | | |
| 403 | 0.6775964 | 0.6775961 | 0.9249571 | 0.6043388 | 0.1940571 | -0.3102965 | -0.2117139 | 0.5043536 | 0.2579804 | 0.5037418 | 0.7853981 | 1.8116551 |
| | 1.2578764 | 0.1904770 | 0.5458443 | 2.1236134 | 2.3031073 | 1.1641150 | 1.0089779 | | | | | |
| 404 | 0.6767745 | 0.6767742 | 0.9244530 | 0.6034156 | 0.1937369 | -0.3113239 | -0.2123914 | 0.5050607 | 0.2583110 | 0.5037110 | 0.7853981 | 1.8086720 |
| | 1.2564783 | 0.1908724 | 0.5453922 | 2.1236391 | 2.3035297 | 1.1632032 | 1.0078163 | | | | | |
| 405 | 0.6759525 | 0.6759526 | 0.9239415 | 0.6024926 | 0.1934167 | -0.3123621 | -0.2130761 | 0.5057787 | 0.2586400 | 0.5036802 | 0.7853981 | 1.8056087 |
| | 1.2550821 | 0.1912677 | 0.5449403 | 2.1236649 | 2.3039404 | 1.1622896 | 1.0066557 | | | | | |
| 406 | 0.6751320 | 0.6751317 | 0.9234312 | 0.6015695 | 0.1930964 | -0.3133992 | -0.2137595 | 0.5064956 | 0.2589668 | 0.5036496 | 0.7853981 | 1.8025589 |
| | 1.2536865 | 0.1916629 | 0.5444883 | 2.1236906 | 2.3043671 | 1.1613750 | 1.0054970 | | | | | |
| 407 | 0.6743119 | 0.6743115 | 0.9229211 | 0.6006466 | 0.1927762 | -0.3144392 | -0.2144389 | 0.5072064 | 0.2592947 | 0.5036188 | 0.7853981 | 1.7995424 |
| | 1.2522875 | 0.1920584 | 0.5440357 | 2.1237173 | 2.3047886 | 1.1604605 | 1.0043354 | | | | | |
| 408 | 0.6734888 | 0.6734877 | 0.9224091 | 0.5997231 | 0.1924559 | -0.3154636 | -0.2151196 | 0.5079195 | 0.2596207 | 0.5035883 | 0.7853981 | 1.7965231 |
| | 1.2508898 | 0.1924543 | 0.5435928 | 2.1237446 | 2.3052102 | 1.1595449 | 1.0031748 | | | | | |
| 409 | 0.6726677 | 0.6726674 | 0.9218982 | 0.5987997 | 0.1921358 | -0.3165151 | -0.2158056 | 0.5086408 | 0.2599466 | 0.5035578 | 0.7853981 | 1.7934780 |
| | 1.2494936 | 0.1928511 | 0.5431288 | 2.1237717 | 2.3056278 | 1.1586294 | 1.0020161 | | | | | |
| 410 | 0.6718443 | 0.6718440 | 0.9213850 | 0.5978763 | 0.1918155 | -0.3175316 | -0.2164813 | 0.5093471 | 0.2602724 | 0.5035274 | 0.7853981 | 1.7905045 |
| | 1.2480977 | 0.1932474 | 0.5426751 | 2.1237974 | 2.3060503 | 1.1577129 | 1.0008526 | | | | | |
| 411 | 0.6710210 | 0.6710207 | 0.9208720 | 0.5969530 | 0.1914953 | -0.3185544 | -0.2171544 | 0.5100497 | 0.2605984 | 0.5034969 | 0.7853981 | 1.7875528 |
| | 1.2466988 | 0.1936444 | 0.5422206 | 2.1238251 | 2.3064756 | 1.1567974 | 0.9996902 | | | | | |
| 412 | 0.6701977 | 0.6701967 | 0.9203566 | 0.5960298 | 0.1911750 | -0.3195882 | -0.2178346 | 0.5107633 | 0.2609204 | 0.5034664 | 0.7853981 | 1.7845621 |
| | 1.2452980 | 0.1940408 | 0.5417666 | 2.1238518 | 2.3068962 | 1.1558800 | 0.9985304 | | | | | |
| 413 | 0.6693755 | 0.6693752 | 0.9199409 | 0.5951062 | 0.1908548 | -0.3206129 | -0.2185085 | 0.5114677 | 0.2612447 | 0.5034359 | 0.7853981 | 1.7816191 |
| | 1.2438960 | 0.1944378 | 0.5413116 | 2.1238794 | 2.3073206 | 1.1549616 | 0.9973669 | | | | | |
| 414 | 0.6685528 | 0.6685525 | 0.9193245 | 0.5941825 | 0.1905346 | -0.3216425 | -0.2191854 | 0.5121771 | 0.2615669 | 0.5034055 | 0.7853981 | 1.7786617 |
| | 1.2424855 | 0.1948349 | 0.5408565 | 2.1239071 | 2.3077431 | 1.1540432 | 0.9962041 | | | | | |
| 415 | 0.6677291 | 0.6677288 | 0.9189077 | 0.5932591 | 0.1902144 | -0.3226718 | -0.2198621 | 0.5128862 | 0.2618895 | 0.5033751 | 0.7853981 | 1.7757130 |
| | 1.2410812 | 0.1952328 | 0.5404004 | 2.1239357 | 2.3081675 | 1.1531248 | 0.9950406 | | | | | |
| 416 | 0.6669045 | 0.6669046 | 0.9182899 | 0.5923356 | 0.1898941 | -0.3236914 | -0.2205389 | 0.5135856 | 0.2622107 | 0.5033450 | 0.7853981 | 1.7728109 |
| | 1.2396754 | 0.1956301 | 0.5399448 | 2.1239634 | 2.3085928 | 1.1522045 | 0.9938763 | | | | | |
| 417 | 0.6660808 | 0.6660805 | 0.9177693 | 0.5914122 | 0.1895739 | -0.3247167 | -0.2212255 | 0.5142906 | 0.2625304 | 0.5033145 | 0.7853981 | 1.7698936 |
| | 1.2382708 | 0.1960275 | 0.5394890 | 2.1239910 | 2.3090172 | 1.1512842 | 0.9927125 | | | | | |
| 418 | 0.6652565 | 0.6652566 | 0.9172481 | 0.5904886 | 0.1892537 | -0.3257410 | -0.2218791 | 0.5149947 | 0.2628500 | 0.5032844 | 0.7853981 | 1.7669878 |
| | 1.2368650 | 0.1964254 | 0.5390325 | 2.1240187 | 2.3094425 | 1.1503639 | 0.9915487 | | | | | |
| 419 | 0.6644324 | 0.6644321 | 0.9167266 | 0.5895652 | 0.1889335 | -0.3267648 | -0.2225233 | 0.5156983 | 0.2631680 | 0.5032540 | 0.7853981 | 1.7640515 |
| | 1.2354584 | 0.1968229 | 0.5385762 | 2.1240462 | 2.3098659 | 1.1494417 | 0.9903842 | | | | | |
| 420 | 0.6636082 | 0.6636080 | 0.9162052 | 0.5886411 | 0.1886132 | -0.3277885 | -0.2232223 | 0.5164018 | 0.2634867 | 0.5032239 | 0.7853981 | 1.7612028 |
| | 1.2340521 | 0.1972210 | 0.5381184 | 2.1240738 | 2.3102892 | 1.1485195 | 0.9892201 | | | | | |
| 421 | 0.6627831 | 0.6627828 | 0.9156824 | 0.5877174 | 0.1882930 | -0.3288152 | -0.2238852 | 0.5170982 | 0.2638046 | 0.5031939 | 0.7853981 | 1.7583485 |
| | 1.2326431 | 0.1976204 | 0.5376607 | 2.1241014 | 2.3107214 | 1.1475973 | 0.9880546 | | | | | |
| 422 | 0.6619582 | 0.6619579 | 0.9151579 | 0.5867936 | 0.1879728 | -0.3298302 | -0.2245615 | 0.5178030 | 0.2641206 | 0.5031638 | 0.7853981 | 1.7554684 |
| | 1.2312346 | 0.1980184 | 0.5372030 | 2.1241290 | 2.3111447 | 1.1466742 | 0.9868897 | | | | | |
| 423 | 0.6611335 | 0.6611336 | 0.9146330 | 0.5858698 | 0.1876526 | -0.3308573 | -0.2252353 | 0.5185099 | 0.2644359 | 0.5031337 | 0.7853981 | 1.7525873 |
| | 1.2298275 | 0.1984178 | 0.5367447 | 2.1241566 | 2.3115721 | 1.1457510 | 0.9857251 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 424 | 0.6603072 | 0.6603070 | 0.9141073 | 0.5849460 | 0.1873323 | -0.3318694 | -0.2258983 | 0.5192018 | 0.2647520 | 0.5031036 | 0.7853581 | 1.7497730 |
| | 1.2284158 | 0.1988168 | 0.5362861 | 2.1241941 | 2.3120922 | 1.1448269 | -0.9845577 | | | | | |
| 425 | 0.6594816 | 0.6594813 | 0.9135804 | 0.5840220 | 0.1879121 | -0.3328897 | -0.2265669 | 0.5199018 | 0.2650664 | 0.5030737 | 0.7853981 | 1.7469330 |
| | 1.2270060 | 0.1992161 | 0.5358271 | 2.1242228 | 2.3124294 | 1.1439918 | -0.9833915 | | | | | |
| 426 | 0.6586550 | 0.6586547 | 0.9130535 | 0.5830578 | 0.1866919 | -0.3339337 | -0.2272311 | 0.5205956 | 0.2653816 | 0.5030435 | 0.7853981 | 1.7441263 |
| | 1.2255526 | 0.1996162 | 0.5353672 | 2.1242533 | 2.3128595 | 1.1427768 | -0.9822339 | | | | | |
| 427 | 0.6578295 | 0.6578296 | 0.9125250 | 0.5821737 | 0.1863717 | -0.3349253 | -0.2279003 | 0.5212970 | 0.2656940 | 0.5030134 | 0.7853581 | 1.7412939 |
| | 1.2241831 | 0.2000161 | 0.5349073 | 2.1242828 | 2.3132877 | 1.1420517 | -0.9810587 | | | | | |
| 428 | 0.6570026 | 0.6570023 | 0.9119960 | 0.5812496 | 0.1860514 | -0.3359323 | -0.2285591 | 0.5219837 | 0.2660075 | 0.5029834 | 0.7853981 | 1.7385283 |
| | 1.2227676 | 0.2004162 | 0.5344470 | 2.1243134 | 2.3137197 | 1.1411257 | -0.9798902 | | | | | |
| 429 | 0.6561761 | 0.6561759 | 0.9114659 | 0.5803251 | 0.1857312 | -0.3369529 | -0.2292271 | 0.5226842 | 0.2663195 | 0.5029538 | 0.7853981 | 1.7357140 |
| | 1.2213545 | 0.2008168 | 0.5339960 | 2.1243439 | 2.3141489 | 1.1401978 | -0.9787229 | | | | | |
| 430 | 0.6553491 | 0.6553488 | 0.9109364 | 0.5794008 | 0.1854110 | -0.3379644 | -0.2298888 | 0.5233754 | 0.2666324 | 0.5029237 | 0.7853981 | 1.7329445 |
| | 1.2199402 | 0.2012181 | 0.5335243 | 2.1243744 | 2.3145809 | 1.1392727 | -0.9775547 | | | | | |
| 431 | 0.6545210 | 0.6545207 | 0.9104136 | 0.5784764 | 0.1850908 | -0.3389723 | -0.2305478 | 0.5240631 | 0.2669431 | 0.5028940 | 0.7853581 | 1.7301550 |
| | 1.2185240 | 0.2016187 | 0.5330630 | 2.1244049 | 2.3150129 | 1.1383438 | -0.9763851 | | | | | |
| 432 | 0.6536923 | 0.6536920 | 0.9098721 | 0.5775516 | 0.1847705 | -0.3399825 | -0.2312092 | 0.5247530 | 0.2672552 | 0.5028639 | 0.7853581 | 1.7274427 |
| | 1.2171059 | 0.2020205 | 0.5326002 | 2.1244364 | 2.3154469 | 1.1374159 | -0.9752147 | | | | | |
| 433 | 0.6528665 | 0.6528662 | 0.9093387 | 0.5766275 | 0.1844503 | -0.3409978 | -0.2318718 | 0.5254481 | 0.2675636 | 0.5028343 | 0.7853981 | 1.7246761 |
| | 1.2156925 | 0.2024217 | 0.5321380 | 2.1244678 | 2.3158771 | 1.1364870 | -0.9740484 | | | | | |
| 434 | 0.6520376 | 0.6520375 | 0.9088050 | 0.5757024 | 0.1841301 | -0.3420104 | -0.2325337 | 0.5261405 | 0.2678738 | 0.5028046 | 0.7853981 | 1.7219286 |
| | 1.2142744 | 0.2028242 | 0.5316744 | 2.1244984 | 2.3163099 | 1.1355581 | -0.9729780 | | | | | |
| 435 | 0.6512095 | 0.6512095 | 0.9082699 | 0.5747781 | 0.1838099 | -0.3430185 | -0.2331921 | 0.5268284 | 0.2681820 | 0.5027750 | 0.7853581 | 1.7192039 |
| | 1.2128553 | 0.2032259 | 0.5312115 | 2.1245308 | 2.3167430 | 1.1346283 | -0.9717084 | | | | | |
| 436 | 0.6503806 | 0.6503806 | 0.9077327 | 0.5738534 | 0.1834896 | -0.3440236 | -0.2338483 | 0.5275132 | 0.2684850 | 0.5027453 | 0.7853581 | 1.7164974 |
| | 1.2114353 | 0.2036276 | 0.5307482 | 2.1245623 | 2.3171787 | 1.1336966 | -0.9705377 | | | | | |
| 437 | 0.6495514 | 0.6495511 | 0.9071962 | 0.5729286 | 0.1831694 | -0.3450304 | -0.2345053 | 0.5281958 | 0.2687970 | 0.5027156 | 0.7853981 | 1.7137518 |
| | 1.2100142 | 0.2040302 | 0.5302839 | 2.1245947 | 2.3176136 | 1.1327658 | -0.9693661 | | | | | |
| 438 | 0.6487225 | 0.6487226 | 0.9066580 | 0.5720037 | 0.1828492 | -0.3460373 | -0.2351624 | 0.5288864 | 0.2691027 | 0.5026860 | 0.7853981 | 1.7110910 |
| | 1.2085953 | 0.2044329 | 0.5298194 | 2.1246271 | 2.3180485 | 1.1318341 | -0.9681961 | | | | | |
| 439 | 0.6478931 | 0.6478928 | 0.9061188 | 0.5710789 | 0.1825290 | -0.3470437 | -0.2358190 | 0.5295727 | 0.2694083 | 0.5026563 | 0.7853981 | 1.7083588 |
| | 1.2071724 | 0.2048355 | 0.5293548 | 2.1246595 | 2.3184834 | 1.1309013 | -0.9670240 | | | | | |
| 440 | 0.6470634 | 0.6470631 | 0.9055794 | 0.5701540 | 0.1822087 | -0.3480487 | -0.2364743 | 0.5302575 | 0.2697136 | 0.5026267 | 0.7853581 | 1.7057190 |
| | 1.2057514 | 0.2052388 | 0.5288893 | 2.1246920 | 2.3189192 | 1.1299686 | -0.9658523 | | | | | |
| 441 | 0.6462348 | 0.6462345 | 0.9050383 | 0.5692290 | 0.1818885 | -0.3490567 | -0.2371315 | 0.5309452 | 0.2700168 | 0.5025971 | 0.7853581 | 1.7030334 |
| | 1.2043304 | 0.2056421 | 0.5284238 | 2.1247244 | 2.3193541 | 1.1290359 | -0.9646818 | | | | | |
| 442 | 0.6454033 | 0.6454033 | 0.9044977 | 0.5683037 | 0.1815683 | -0.3500524 | -0.2377803 | 0.5316207 | 0.2703222 | 0.5025678 | 0.7853981 | 1.7004023 |
| | 1.2029093 | 0.2060463 | 0.5279570 | 2.1247578 | 2.3197947 | 1.1281023 | -0.9635078 | | | | | |
| 443 | 0.6445738 | 0.6445735 | 0.9039562 | 0.5673784 | 0.1812481 | -0.3510587 | -0.2384358 | 0.5323067 | 0.2706255 | 0.5025385 | 0.7853981 | 1.6977348 |
| | 1.2014818 | 0.2064506 | 0.5274900 | 2.1247902 | 2.3202305 | 1.1271697 | -0.9623361 | | | | | |
| 444 | 0.6437430 | 0.6437427 | 0.9034126 | 0.5664529 | 0.1809278 | -0.3520618 | -0.2390891 | 0.5329856 | 0.2709280 | 0.5025089 | 0.7853581 | 1.6950874 |
| | 1.2000561 | 0.2068549 | 0.5270228 | 2.1248236 | 2.3206682 | 1.1262331 | -0.9611626 | | | | | |
| 445 | 0.6429125 | 0.6429122 | 0.9028689 | 0.5655276 | 0.1806076 | -0.3530614 | -0.2397359 | 0.5336650 | 0.2712259 | 0.5024796 | 0.7853981 | 1.6924591 |
| | 1.1986303 | 0.2072555 | 0.5265552 | 2.1248575 | 2.3211069 | 1.1252975 | -0.9599897 | | | | | |
| 446 | 0.6420802 | 0.6420799 | 0.9023243 | 0.5646020 | 0.1802874 | -0.3540577 | -0.2403803 | 0.5343450 | 0.2715322 | 0.5024500 | 0.7853981 | 1.6898489 |
| | 1.1972017 | 0.2076646 | 0.5260868 | 2.1248922 | 2.3215495 | 1.1243620 | -0.9588141 | | | | | |
| 447 | 0.6412503 | 0.6412500 | 0.9017785 | 0.5636765 | 0.1799672 | -0.3550612 | -0.2410241 | 0.5350283 | 0.2718318 | 0.5024207 | 0.7853581 | 1.6872177 |
| | 1.1957765 | 0.2080697 | 0.5256184 | 2.1249256 | 2.3219862 | 1.1234255 | -0.9576421 | | | | | |
| 448 | 0.6404176 | 0.6404173 | 0.9012315 | 0.5627508 | 0.1796469 | -0.3560596 | -0.2416906 | 0.5357065 | 0.2721326 | 0.5023915 | 0.7853581 | 1.6846123 |
| | 1.1943474 | 0.2084751 | 0.5251493 | 2.1249599 | 2.3224268 | 1.1224880 | -0.9564662 | | | | | |
| 449 | 0.6395860 | 0.6395857 | 0.9006835 | 0.5618253 | 0.1793267 | -0.3570535 | -0.2423566 | 0.5363802 | 0.2724307 | 0.5023622 | 0.7853581 | 1.6820288 |
| | 1.1929178 | 0.2088803 | 0.5246805 | 2.1249943 | 2.3228674 | 1.1215496 | -0.9552915 | | | | | |
| 450 | 0.6387535 | 0.6387532 | 0.9001355 | 0.5608994 | 0.1790065 | -0.3580474 | -0.2429827 | 0.5370539 | 0.2727300 | 0.5023329 | 0.7853981 | 1.6794519 |
| | 1.1914873 | 0.2092865 | 0.5242104 | 2.1250296 | 2.3233099 | 1.1206121 | -0.9541159 | | | | | |
| 451 | 0.6379207 | 0.6379204 | 0.8995877 | 0.5599734 | 0.1786863 | -0.3590403 | -0.2436277 | 0.5377266 | 0.2730298 | 0.5023037 | 0.7853981 | 1.6768856 |
| | 1.1900566 | 0.2096934 | 0.5237393 | 2.1250659 | 2.3237534 | 1.1196737 | -0.9529399 | | | | | |
| 452 | 0.6370881 | 0.6370878 | 0.8990377 | 0.5590472 | 0.1783660 | -0.3600416 | -0.2442783 | 0.5384076 | 0.2733275 | 0.5022745 | 0.7853581 | 1.6742526 |
| | 1.1886262 | 0.2101003 | 0.5232682 | 2.1251032 | 2.3241993 | 1.1187344 | -0.9517638 | | | | | |
| 453 | 0.6362546 | 0.6362545 | 0.8984855 | 0.5581213 | 0.1780458 | -0.3610389 | -0.2449206 | 0.5390767 | 0.2736233 | 0.5022455 | 0.7853581 | 1.6717501 |
| | 1.1871920 | 0.2105065 | 0.5227975 | 2.1251345 | 2.3246384 | 1.1177940 | -0.9505869 | | | | | |
| 454 | 0.6354238 | 0.6354235 | 0.8979345 | 0.5571952 | 0.1777256 | -0.3620331 | -0.2455711 | 0.5397587 | 0.2739187 | 0.5022163 | 0.7853981 | 1.6691656 |
| | 1.1857634 | 0.2109140 | 0.5223255 | 2.1251737 | 2.3250753 | 1.1168537 | -0.9494134 | | | | | |
| 455 | 0.6345875 | 0.6345876 | 0.8973814 | 0.5562689 | 0.1774054 | -0.3630130 | -0.2462173 | 0.5404184 | 0.2742157 | 0.5021874 | 0.7853581 | 1.6666708 |
| | 1.1843352 | 0.2113212 | 0.5218534 | 2.1252060 | 2.3255272 | 1.1159124 | -0.9482327 | | | | | |
| 456 | 0.6337625 | 0.6337625 | 0.8968264 | 0.5553426 | 0.1770851 | -0.3639922 | -0.2468637 | 0.5410953 | 0.2745956 | 0.5021580 | 0.7853581 | 1.6643427 |
| | 1.1829096 | 0.2117283 | 0.5213813 | 2.1252470 | 2.3259620 | 1.1149702 | -0.9470541 | | | | | |
| 457 | 0.6329162 | 0.6329159 | 0.8962727 | 0.5544162 | 0.1767649 | -0.3649752 | -0.2475101 | 0.5417401 | 0.2748969 | 0.5021290 | 0.7853581 | 1.6618879 |
| | 1.1814885 | 0.2121364 | 0.5209077 | 2.1252875 | 2.3264027 | 1.1140280 | -0.9458719 | | | | | |
| 458 | 0.6319556 | 0.6319558 | 0.8957175 | 0.5534907 | 0.1764446 | -0.3659533 | -0.2481429 | 0.5423839 | 0.2751853 | 0.5020998 | 0.7853981 | 1.6613197 |
| | 1.1799662 | 0.2125448 | 0.5204340 | 2.1253285 | 2.3268436 | 1.1130857 | -0.9446959 | | | | | |
| 459 | 0.6311183 | 0.6311180 | 0.8951610 | 0.5525630 | 0.1761245 | -0.3669279 | -0.2487744 | 0.5424923 | 0.2754802 | 0.5020666 | 0.7853981 | 1.6588621 |
| | 1.1783543 | 0.2129531 | 0.5199599 | 2.1253697 | 2.3272837 | 1.1121426 | -0.9433127 | | | | | |



******* ********** ******* ***** **

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 460 | 0.6302841 | 0.6302838 | 0.8946051 | 0.5516262 | 0.1758042 | -0.3673589 | -0.2490166 | 0.5431631 | 0.2757735 | 0.5020378 | 0.7853981 | 1.6563482 |
| | 1.1769180 | 0.2133527 | 0.5194846 | 2.1253925 | 2.3279600 | 1.1111994 | 0.9421546 | | | | | |
| 461 | 0.6294484 | 0.6294481 | 0.8940479 | 0.5507093 | 0.1754840 | -0.3683434 | -0.2496542 | 0.5438274 | 0.2760662 | 0.5020099 | 0.7853981 | 1.6563649 |
| | 1.1754785 | 0.2137623 | 0.5190091 | 2.1254371 | 2.3284792 | 1.1112562 | 0.9409744 | | | | | |
| 462 | 0.6286115 | 0.6286116 | 0.8934892 | 0.5497820 | 0.1751637 | -0.3693216 | -0.2502874 | 0.5444854 | 0.2763584 | 0.5019800 | 0.7853981 | 1.6514091 |
| | 1.1740370 | 0.2141121 | 0.5185331 | 2.1254683 | 2.3288603 | 1.1093111 | 0.9397931 | | | | | |
| 463 | 0.6277763 | 0.6277760 | 0.8929314 | 0.5488550 | 0.1748435 | -0.3703221 | -0.2509219 | 0.5451457 | 0.2766598 | 0.5019512 | 0.7853581 | 1.6489515 |
| | 1.1725965 | 0.2145028 | 0.5180560 | 2.1255054 | 2.3293114 | 1.1083679 | 0.9386131 | | | | | |
| 464 | 0.6269401 | 0.6269398 | 0.8923702 | 0.5479279 | 0.1745233 | -0.3712907 | -0.2515616 | 0.5458140 | 0.2769404 | 0.5019223 | 0.7853581 | 1.6464691 |
| | 1.1711555 | 0.2149527 | 0.5175796 | 2.1255426 | 2.3297596 | 1.1074209 | 0.9374319 | | | | | |
| 465 | 0.6261034 | 0.6261031 | 0.8918085 | 0.5470009 | 0.1742031 | -0.3722699 | -0.2521948 | 0.5464730 | 0.2772297 | 0.5018939 | 0.7853981 | 1.6440258 |
| | 1.1697130 | 0.2154028 | 0.5171028 | 2.1255808 | 2.3302107 | 1.1064739 | 0.9362504 | | | | | |
| 466 | 0.6252658 | 0.6252655 | 0.8912453 | 0.5460736 | 0.1738828 | -0.3732490 | -0.2528279 | 0.5471318 | 0.2775182 | 0.5018651 | 0.7853581 | 1.6415882 |
| | 1.1682692 | 0.2158131 | 0.5166255 | 2.1256189 | 2.3306618 | 1.1055260 | 0.9350675 | | | | | |
| 467 | 0.6244285 | 0.6244282 | 0.8906829 | 0.5451460 | 0.1735626 | -0.3742272 | -0.2534602 | 0.5477899 | 0.2778075 | 0.5018362 | 0.7853581 | 1.6391602 |
| | 1.1668253 | 0.2162247 | 0.5161468 | 2.1256580 | 2.3311148 | 1.1045790 | 0.9338850 | | | | | |
| 468 | 0.6235906 | 0.6235903 | 0.8901187 | 0.5442185 | 0.1732424 | -0.3752122 | -0.2540901 | 0.5484446 | 0.2780955 | 0.5018077 | 0.7853581 | 1.6367483 |
| | 1.1653786 | 0.2166359 | 0.5156682 | 2.1256962 | 2.3315687 | 1.1036310 | 0.9327017 | | | | | |
| 469 | 0.6227533 | 0.6227530 | 0.8895538 | 0.5432909 | 0.1729222 | -0.3761872 | -0.2547264 | 0.5491054 | 0.2783823 | 0.5017788 | 0.7853981 | 1.6343050 |
| | 1.1639347 | 0.2170477 | 0.5151890 | 2.1257353 | 2.3320198 | 1.1026821 | 0.9315193 | | | | | |
| 470 | 0.6219141 | 0.6219138 | 0.8889885 | 0.5423630 | 0.1726019 | -0.3771552 | -0.2553513 | 0.5497571 | 0.2786700 | 0.5017505 | 0.7853981 | 1.6319304 |
| | 1.1624861 | 0.2174600 | 0.5147085 | 2.1257744 | 2.3324766 | 1.1017332 | 0.9303342 | | | | | |
| 471 | 0.6210773 | 0.6210770 | 0.8884215 | 0.5414352 | 0.1722817 | -0.3781424 | -0.2559885 | 0.5504241 | 0.2789546 | 0.5017219 | 0.7853581 | 1.6294899 |
| | 1.1610422 | 0.2178723 | 0.5142288 | 2.1258135 | 2.3329277 | 1.1007833 | 0.9291526 | | | | | |
| 472 | 0.6202381 | 0.6202378 | 0.8878544 | 0.5405072 | 0.1719615 | -0.3791149 | -0.2566161 | 0.5510764 | 0.2792407 | 0.5016931 | 0.7853581 | 1.6271086 |
| | 1.1595936 | 0.2182852 | 0.5137478 | 2.1258535 | 2.3333836 | 1.0998335 | 0.9279674 | | | | | |
| 473 | 0.6193994 | 0.6193991 | 0.8872851 | 0.5395793 | 0.1716413 | -0.3810094 | -0.2572446 | 0.5517307 | 0.2795244 | 0.5016646 | 0.7853981 | 1.6247234 |
| | 1.1581450 | 0.2186977 | 0.5132670 | 2.1258926 | 2.3338385 | 1.0988817 | 0.9267829 | | | | | |
| 474 | 0.6185608 | 0.6185605 | 0.8867149 | 0.5386513 | 0.1713210 | -0.3810691 | -0.2578763 | 0.5523902 | 0.2798071 | 0.5016362 | 0.7853581 | 1.6223259 |
| | 1.1566963 | 0.2191106 | 0.5127857 | 2.1259327 | 2.3342924 | 1.0979290 | 0.9255967 | | | | | |
| 475 | 0.6177186 | 0.6177185 | 0.8861443 | 0.5377231 | 0.1710008 | -0.3820251 | -0.2585222 | 0.5530259 | 0.2800919 | 0.5016077 | 0.7853981 | 1.6200199 |
| | 1.1552410 | 0.2195239 | 0.5123035 | 2.1259727 | 2.3347540 | 1.0969763 | 0.9244095 | | | | | |
| 476 | 0.6168810 | 0.6168807 | 0.8855714 | 0.5367949 | 0.1706816 | -0.3830394 | -0.2591267 | 0.5536909 | 0.2803715 | 0.5015793 | 0.7853581 | 1.6176147 |
| | 1.1537933 | 0.2199370 | 0.5118216 | 2.1260138 | 2.3352070 | 1.0960226 | 0.9232266 | | | | | |
| 477 | 0.6160395 | 0.6160392 | 0.8849996 | 0.5359663 | 0.1703604 | -0.3839792 | -0.2597515 | 0.5543356 | 0.2806549 | 0.5015509 | 0.7853981 | 1.6152687 |
| | 1.1523350 | 0.2203514 | 0.5113381 | 2.1260549 | 2.3356657 | 1.0950689 | 0.9220381 | | | | | |
| 478 | 0.6151982 | 0.6151979 | 0.8844271 | 0.5349379 | 0.1700401 | -0.3849396 | -0.2603697 | 0.5549797 | 0.2809373 | 0.5015228 | 0.7853581 | 1.6129559 |
| | 1.1508837 | 0.2207660 | 0.5108541 | 2.1260958 | 2.3361273 | 1.0941153 | 0.9208501 | | | | | |
| 479 | 0.6143559 | 0.6143556 | 0.8838521 | 0.5340093 | 0.1697199 | -0.3858217 | -0.2610021 | 0.5556417 | 0.2812159 | 0.5014943 | 0.7853581 | 1.6105785 |
| | 1.1494341 | 0.2211805 | 0.5103703 | 2.1261358 | 2.3365822 | 1.0931606 | 0.9196655 | | | | | |
| 480 | 0.6135184 | 0.6135181 | 0.8832772 | 0.5331814 | 0.1693997 | -0.3868090 | -0.2616243 | 0.5562887 | 0.2814960 | 0.5014659 | 0.7853581 | 1.6082554 |
| | 1.1479751 | 0.2215958 | 0.5098853 | 2.1261778 | 2.3370419 | 1.0922059 | 0.9184780 | | | | | |
| 481 | 0.6126773 | 0.6126770 | 0.8827016 | 0.5321536 | 0.1690795 | -0.3878563 | -0.2622466 | 0.5569358 | 0.2817754 | 0.5014378 | 0.7853981 | 1.6059380 |
| | 1.1465235 | 0.2220113 | 0.5093999 | 2.1262197 | 2.3375025 | 1.0912495 | 0.9172893 | | | | | |
| 482 | 0.6118365 | 0.6118362 | 0.8821257 | 0.5312224 | 0.1687592 | -0.3888199 | -0.2628661 | 0.5575791 | 0.2820556 | 0.5014094 | 0.7853581 | 1.6036377 |
| | 1.1450672 | 0.2224276 | 0.5089134 | 2.1262608 | 2.3379650 | 1.0902939 | 0.9161007 | | | | | |
| 483 | 0.6119538 | 0.6109533 | 0.8815477 | 0.5302936 | 0.1684390 | -0.3897853 | -0.2634865 | 0.5582244 | 0.2823329 | 0.5013813 | 0.7853581 | 1.6013355 |
| | 1.1436100 | 0.2228434 | 0.5084274 | 2.1263037 | 2.3384266 | 1.0893364 | 0.9149125 | | | | | |
| 484 | 0.6101516 | 0.6101513 | 0.8809689 | 0.5293643 | 0.1681188 | -0.3907514 | -0.2641076 | 0.5588702 | 0.2826102 | 0.5013533 | 0.7853581 | 1.5990353 |
| | 1.1421518 | 0.2232559 | 0.5079404 | 2.1263466 | 2.3388882 | 1.0883789 | 0.9137235 | | | | | |
| 485 | 0.6093075 | 0.6093072 | 0.8803885 | 0.5284350 | 0.1677986 | -0.3917125 | -0.2647246 | 0.5595111 | 0.2828872 | 0.5013248 | 0.7853981 | 1.5967588 |
| | 1.1406918 | 0.2236761 | 0.5074533 | 2.1263885 | 2.3393517 | 1.0874195 | 0.9125314 | | | | | |
| 486 | 0.6084647 | 0.6084644 | 0.8798081 | 0.5275057 | 0.1674783 | -0.3926685 | -0.2653385 | 0.5601469 | 0.2831634 | 0.5012972 | 0.7853581 | 1.5945044 |
| | 1.1392298 | 0.2240931 | 0.5069653 | 2.1264324 | 2.3398181 | 1.0864611 | 0.9113415 | | | | | |
| 487 | 0.6076217 | 0.6076214 | 0.8792257 | 0.5265753 | 0.1671581 | -0.3936204 | -0.2659625 | 0.5607985 | 0.2834377 | 0.5012687 | 0.7853581 | 1.5921974 |
| | 1.1377716 | 0.2245101 | 0.5064773 | 2.1264744 | 2.3402786 | 1.0855007 | 0.9101509 | | | | | |
| 488 | 0.6067756 | 0.6067787 | 0.8786429 | 0.5256465 | 0.1668379 | -0.3946091 | -0.2665781 | 0.5614380 | 0.2837118 | 0.5012410 | 0.7853581 | 1.5899391 |
| | 1.1363106 | 0.2249277 | 0.5059883 | 2.1265182 | 2.3407431 | 1.0845494 | 0.9089611 | | | | | |
| 489 | 0.6059341 | 0.6059338 | 0.8780596 | 0.5247167 | 0.1665177 | -0.3955627 | -0.2671957 | 0.5620804 | 0.2839867 | 0.5012127 | 0.7853981 | 1.5876751 |
| | 1.1348476 | 0.2253457 | 0.5054986 | 2.1265612 | 2.3412085 | 1.0835971 | 0.9077678 | | | | | |
| 490 | 0.6050905 | 0.6050902 | 0.8774764 | 0.5237869 | 0.1661974 | -0.3965212 | -0.2678101 | 0.5627196 | 0.2842609 | 0.5011849 | 0.7853981 | 1.5854311 |
| | 1.1333841 | 0.2257645 | 0.5050081 | 2.1266050 | 2.3416743 | 1.0826187 | 0.9065766 | | | | | |
| 491 | 0.6042466 | 0.6042463 | 0.8768931 | 0.5228571 | 0.1658772 | -0.3974824 | -0.2684263 | 0.5633556 | 0.2845324 | 0.5011569 | 0.7853581 | 1.5831804 |
| | 1.1319218 | 0.2261827 | 0.5045179 | 2.1266499 | 2.3421402 | 1.0816565 | 0.9053851 | | | | | |
| 492 | 0.6034011 | 0.6034008 | 0.8763098 | 0.5219267 | 0.1655571 | -0.3984370 | -0.2690378 | 0.5639940 | 0.2848049 | 0.5011289 | 0.7853581 | 1.5809584 |
| | 1.1304560 | 0.2266018 | 0.5040266 | 2.1266937 | 2.3426085 | 1.0806932 | 0.9041917 | | | | | |
| 493 | 0.6025556 | 0.6025555 | 0.8757262 | 0.5209962 | 0.1652368 | -0.3993944 | -0.2696511 | 0.5646312 | 0.2850772 | 0.5011012 | 0.7853581 | 1.5787315 |
| | 1.1289854 | 0.2270216 | 0.5035343 | 2.1267385 | 2.3430777 | 1.0797230 | 0.9029973 | | | | | |
| 494 | 0.6017122 | 0.6017119 | 0.8751303 | 0.5200658 | 0.1649165 | -0.4003539 | -0.2702655 | 0.5652703 | 0.2853481 | 0.5010731 | 0.7853981 | 1.5765009 |
| | 1.1275253 | 0.2274419 | 0.5030415 | 2.1267834 | 2.3435465 | 1.0787478 | 0.9018161 | | | | | |
| 495 | 0.6008854 | 0.6008851 | 0.8745508 | 0.5191354 | 0.1645963 | -0.4013167 | -0.2708751 | 0.5659033 | 0.2856164 | 0.5010454 | 0.7853581 | 1.5742979 |
| | 1.1260567 | 0.2278615 | 0.5025499 | 2.1268282 | 2.3440151 | 1.0777727 | 0.9006134 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 496 | 0.6000195 | 0.6000196 | 0.8739510 | 0.5182046 | 0.1642761-0.4022617-0.2714862 | 0.5665378 | 0.2858878 | 0.5010178 | 0.7853981 | 1.5720921 |
| | 1.1245880 | 0.2282622 | 0.5020551 | 2.1268740 | 2.3444953 1.0768375 0.8994166 | | | | | |
| 497 | 0.5991737 | 0.5991734 | 0.8733615 | 0.5172739 | 0.1639559-0.4032165-0.2720969 | 0.5671723 | 0.2861581 | 0.5009897 | 0.7853981 | 1.5698919 |
| | 1.1231213 | 0.2287035 | 0.5015605 | 2.1269188 | 2.3449554 1.0758734 0.8982214 | | | | | |
| 498 | 0.5983272 | 0.5983269 | 0.8727702 | 0.5163428 | 0.1635356-0.4041681-0.2727054 | 0.5678037 | 0.2864268 | 0.5009621 | 0.7853981 | 1.5677061 |
| | 1.1216507 | 0.2291250 | 0.5010655 | 2.1269646 | 2.3454275 1.0749973 0.8970262 | | | | | |
| 499 | 0.5974802 | 0.5974799 | 0.8721776 | 0.5154119 | 0.1633154-0.4051244-0.2733167 | 0.5684398 | 0.2866545 | 0.5009345 | 0.7853981 | 1.5655088 |
| | 1.1201801 | 0.2295464 | 0.5005702 | 2.1270133 | 2.3459986 1.0739603 0.8958303 | | | | | |
| 500 | 0.5966324 | 0.5966321 | 0.8715847 | 0.5144805 | 0.1629952-0.4060714-0.2739215 | 0.5690666 | 0.2869627 | 0.5009068 | 0.7853981 | 1.5633488 |
| | 1.1187077 | 0.2299667 | 0.5000739 | 2.1270571 | 2.3463726 1.0729733 0.8946332 | | | | | |
| 501 | 0.5957854 | 0.5957851 | 0.8709905 | 0.5135494 | 0.1626750-0.4070268-0.2745319 | 0.5697017 | 0.2872289 | 0.5008792 | 0.7853981 | 1.5611629 |
| | 1.1172361 | 0.2303909 | 0.4995775 | 2.1271038 | 2.3468447 1.0720153 0.8934372 | | | | | |
| 502 | 0.5949375 | 0.5949376 | 0.8703956 | 0.5126179 | 0.1623547-0.4079730-0.2751359 | 0.5703277 | 0.2874951 | 0.5008518 | 0.7853981 | 1.5590134 |
| | 1.1157618 | 0.2308138 | 0.4990802 | 2.1271515 | 2.3473196 1.0710373 0.8922403 | | | | | |
| 503 | 0.5940906 | 0.5941903 | 0.8697994 | 0.5116863 | 0.1620345-0.4089242-0.2757431 | 0.5709587 | 0.2877559 | 0.5008242 | 0.7853981 | 1.5568514 |
| | 1.1142093 | 0.2312371 | 0.4985824 | 2.1271992 | 2.3477936 1.0700684 0.8910439 | | | | | |
| 504 | 0.5932421 | 0.5932418 | 0.8692033 | 0.5107545 | 0.1617143-0.4098747-0.2763495 | 0.5715850 | 0.2880255 | 0.5007966 | 0.7853981 | 1.5546951 |
| | 1.1128145 | 0.2316609 | 0.4980836 | 2.1272449 | 2.3482685 1.0690994 0.8898458 | | | | | |
| 505 | 0.5923932 | 0.5923929 | 0.8686042 | 0.5098229 | 0.1613941-0.4108245-0.2769553 | 0.5722186 | 0.2882885 | 0.5007693 | 0.7853981 | 1.5525465 |
| | 1.1113386 | 0.2320840 | 0.4975853 | 2.1272926 | 2.3487434 1.0681276 0.8886473 | | | | | |
| 506 | 0.5915438 | 0.5915435 | 0.8680052 | 0.5088907 | 0.1610738-0.4117710-0.2775586 | 0.5728448 | 0.2885522 | 0.5007415 | 0.7853981 | 1.5504122 |
| | 1.1098614 | 0.2325084 | 0.4970856 | 2.1273403 | 2.3492203 1.0671558 0.8874478 | | | | | |
| 507 | 0.5906944 | 0.5906941 | 0.8674055 | 0.5079586 | 0.1607536-0.4127112-0.2781577 | 0.5734648 | 0.2888151 | 0.5007143 | 0.7853981 | 1.5483046 |
| | 1.1083832 | 0.2329329 | 0.4965954 | 2.1273880 | 2.3496990 1.0661850 0.8862485 | | | | | |
| 508 | 0.5898446 | 0.5898445 | 0.8668051 | 0.5070263 | 0.1604334-0.4136566-0.2787559 | 0.5740899 | 0.2890776 | 0.5006866 | 0.7853981 | 1.5461826 |
| | 1.1069056 | 0.2333581 | 0.4960845 | 2.1274376 | 2.3501768 1.0652132 0.8850489 | | | | | |
| 509 | 0.5889942 | 0.5889939 | 0.8662040 | 0.5060939 | 0.1601132-0.4145960-0.2793581 | 0.5747092 | 0.2893399 | 0.5006594 | 0.7853981 | 1.5440845 |
| | 1.1054245 | 0.2337837 | 0.4955828 | 2.1274862 | 2.3506575 1.0642405 0.8838478 | | | | | |
| 510 | 0.5881436 | 0.5881435 | 0.8656009 | 0.5051613 | 0.1597929-0.4155430-0.2799610 | 0.5753359 | 0.2896005 | 0.5006321 | 0.7853981 | 1.5419655 |
| | 1.1039448 | 0.2342092 | 0.4950809 | 2.1275349 | 2.3511362 1.0632668 0.8826479 | | | | | |
| 511 | 0.5872944 | 0.5872941 | 0.8649985 | 0.5042283 | 0.1594727-0.4164929-0.2805651 | 0.5759647 | 0.2898614 | 0.5006049 | 0.7853981 | 1.5398445 |
| | 1.1024666 | 0.2346363 | 0.4945773 | 2.1275845 | 2.3516150 1.0622940 0.8814479 | | | | | |
| 512 | 0.5864432 | 0.5864429 | 0.8643950 | 0.5032955 | 0.1591524-0.4174295-0.2811613 | 0.5765820 | 0.2901217 | 0.5005776 | 0.7853981 | 1.5377645 |
| | 1.1009886 | 0.2350631 | 0.4940735 | 2.1276331 | 2.3520975 1.0613203 0.8802458 | | | | | |
| 513 | 0.5855926 | 0.5855923 | 0.8637898 | 0.5023624 | 0.1588322-0.4183748-0.2817625 | 0.5772070 | 0.2903805 | 0.5005503 | 0.7853981 | 1.5356636 |
| | 1.0995106 | 0.2354901 | 0.4935698 | 2.1276836 | 2.3525772 1.0603447 0.8790459 | | | | | |
| 514 | 0.5847395 | 0.5847396 | 0.8631852 | 0.5014291 | 0.1585120-0.4193090-0.2823564 | 0.5778210 | 0.2906413 | 0.5005230 | 0.7853981 | 1.5336046 |
| | 1.0980167 | 0.2359183 | 0.4930643 | 2.1277332 | 2.3530626 1.0593700 0.8778407 | | | | | |
| 515 | 0.5838879 | 0.5838876 | 0.8625788 | 0.5004958 | 0.1581917-0.4202476-0.2829528 | 0.5784393 | 0.2908999 | 0.5004958 | 0.7853981 | 1.5315342 |
| | 1.0965328 | 0.2363464 | 0.4925587 | 2.1277838 | 2.3535461 1.0583944 0.8766380 | | | | | |
| 516 | 0.5830365 | 0.5830362 | 0.8619715 | 0.4995625 | 0.1578715-0.4211907-0.2835519 | 0.5790622 | 0.2911572 | 0.5004686 | 0.7853981 | 1.5294514 |
| | 1.0950485 | 0.2367749 | 0.4920526 | 2.1278343 | 2.3540287 1.0574179 0.8754357 | | | | | |
| 517 | 0.5821846 | 0.5821843 | 0.8613632 | 0.4986286 | 0.1575513-0.4221306-0.2841487 | 0.5796819 | 0.2914141 | 0.5004417 | 0.7853981 | 1.5273848 |
| | 1.0935631 | 0.2372040 | 0.4915455 | 2.1278858 | 2.3545132 1.0564404 0.8742329 | | | | | |
| 518 | 0.5813306 | 0.5813303 | 0.8607527 | 0.4976951 | 0.1572311-0.4230617-0.2847396 | 0.5802928 | 0.2916702 | 0.5004144 | 0.7853981 | 1.5253496 |
| | 1.0920744 | 0.2376324 | 0.4910388 | 2.1279364 | 2.3549995 1.0554619 0.8730270 | | | | | |
| 519 | 0.5804785 | 0.5804782 | 0.8601426 | 0.4967612 | 0.1569108-0.4240009-0.2853357 | 0.5809118 | 0.2919254 | 0.5003872 | 0.7853981 | 1.5232925 |
| | 1.0905886 | 0.2380623 | 0.4905306 | 2.1279879 | 2.3554850 1.0544844 0.8718239 | | | | | |
| 520 | 0.5796254 | 0.5796251 | 0.8595300 | 0.4958273 | 0.1565906-0.4249418-0.2859325 | 0.5815325 | 0.2921791 | 0.5003603 | 0.7853981 | 1.5212336 |
| | 1.0891108 | 0.2384915 | 0.4900225 | 2.1280394 | 2.3559694 1.0535140 0.8706195 | | | | | |
| 521 | 0.5787705 | 0.5787706 | 0.8589173 | 0.4948929 | 0.1562704-0.4258741-0.2865236 | 0.5821445 | 0.2924336 | 0.5003334 | 0.7853981 | 1.5192070 |
| | 1.0876102 | 0.2389218 | 0.4895133 | 2.1280909 | 2.3564577 1.0525236 0.8694133 | | | | | |
| 522 | 0.5779161 | 0.5779158 | 0.8583050 | 0.4939585 | 0.1559502-0.4268031-0.2871123 | 0.5827532 | 0.2926888 | 0.5003065 | 0.7853981 | 1.5171957 |
| | 1.0861187 | 0.2393531 | 0.4890028 | 2.1281433 | 2.3569479 1.0515442 0.8682062 | | | | | |
| 523 | 0.5770619 | 0.5770616 | 0.8576912 | 0.4930240 | 0.1556299-0.4277340-0.2877029 | 0.5833640 | 0.2929421 | 0.5002797 | 0.7853981 | 1.5151806 |
| | 1.0846272 | 0.2397844 | 0.4884920 | 2.1281967 | 2.3574381 1.0505638 0.8670001 | | | | | |
| 524 | 0.5762074 | 0.5762071 | 0.8570764 | 0.4920892 | 0.1553097-0.4286697-0.2882946 | 0.5839794 | 0.2931947 | 0.5002527 | 0.7853981 | 1.5131540 |
| | 1.0831356 | 0.2402163 | 0.4879804 | 2.1282492 | 2.3579264 1.0495815 0.8657936 | | | | | |
| 525 | 0.5753516 | 0.5753513 | 0.8564618 | 0.4911539 | 0.1549895-0.4296027-0.2888854 | 0.5845922 | 0.2934486 | 0.5002255 | 0.7853981 | 1.5111408 |
| | 1.0816422 | 0.2406493 | 0.4874673 | 2.1283016 | 2.3584175 1.0486002 0.8645853 | | | | | |
| 526 | 0.5744953 | 0.5744950 | 0.8558460 | 0.4902189 | 0.1546693-0.4305261-0.2894695 | 0.5851954 | 0.2937017 | 0.5001987 | 0.7853981 | 1.5091619 |
| | 1.0801466 | 0.2410823 | 0.4869541 | 2.1283550 | 2.3589115 1.0476189 0.8633761 | | | | | |
| 527 | 0.5736401 | 0.5736398 | 0.8552292 | 0.4892837 | 0.1543493-0.4314554-0.2900577 | 0.5858045 | 0.2939528 | 0.5001721 | 0.7853981 | 1.5071669 |
| | 1.0786524 | 0.2415159 | 0.4864402 | 2.1284094 | 2.3594046 1.0466366 0.8621688 | | | | | |
| 528 | 0.5727841 | 0.5727838 | 0.8546110 | 0.4883484 | 0.1540288-0.4323857-0.2906459 | 0.5864145 | 0.2942035 | 0.5001453 | 0.7853981 | 1.5051727 |
| | 1.0771570 | 0.2419494 | 0.4859259 | 2.1284628 | 2.3598967 1.0456524 0.8609601 | | | | | |
| 529 | 0.5719286 | 0.5719283 | 0.8539906 | 0.4874133 | 0.1537096-0.4333193-0.2912362 | 0.5870278 | 0.2944514 | 0.5001184 | 0.7853981 | 1.5031719 |
| | 1.0756626 | 0.2423826 | 0.4854118 | 2.1285172 | 2.3603878 1.0446672 0.8597523 | | | | | |
| 530 | 0.5710714 | 0.5710712 | 0.8533684 | 0.4864777 | 0.1533904-0.4342530-0.2918197 | 0.5876313 | 0.2946991 | 0.5000919 | 0.7853981 | 1.5012064 |
| | 1.0741634 | 0.2428160 | 0.4848970 | 2.1285715 | 2.3608829 1.0436811 0.8585423 | | | | | |
| 531 | 0.5702131 | 0.5702129 | 0.8527464 | 0.4855419 | 0.1530681-0.4351679-0.2924034 | 0.5882351 | 0.2949477 | 0.5000651 | 0.7853981 | 1.4992437 |
| | 1.0726632 | 0.2432504 | 0.4843810 | 2.1286269 | 2.3613787 1.0426941 0.8573305 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 532 | 0.5693557 | 0.5693555 | 0.8521254 | 0.4846057 | 0.1527479 | -0.4360930 | -0.2929882 | 0.5888409 | 0.2951968 | 0.5000386 | 0.7853981 | 1.4972782 |
| | 1.0711641 | 0.2436664 | 0.4838633 | 2.1286821 | 2.3618755 | 1.0417189 | 0.8561199 | | | | | |
| 533 | 0.5684996 | 0.5684554 | 0.8515029 | 0.4836656 | 0.1524277 | -0.4370262 | -0.2935774 | 0.5894539 | 0.2954435 | 0.5000117 | 0.7853981 | 1.4952527 |
| | 1.0696678 | 0.2441224 | 0.4833453 | 2.1287374 | 2.3623695 | 1.0407228 | 0.8549114 | | | | | |
| 534 | 0.5676402 | 0.5676359 | 0.8508779 | 0.4827334 | 0.1521075 | -0.4379422 | -0.2941551 | 0.5900497 | 0.2956903 | 0.4999852 | 0.7853981 | 1.4933672 |
| | 1.0681635 | 0.2445579 | 0.4829274 | 2.1287928 | 2.3628623 | 1.0397339 | 0.8536978 | | | | | |
| 535 | 0.5667811 | 0.5667815 | 0.8502533 | 0.4817566 | 0.1517872 | -0.4388695 | -0.2947401 | 0.5906567 | 0.2959367 | 0.4999588 | 0.7853981 | 1.4914083 |
| | 1.0666618 | 0.2449550 | 0.4823078 | 2.1288490 | 2.3633671 | 1.0387459 | 0.8524859 | | | | | |
| 536 | 0.5659221 | 0.5659219 | 0.8496280 | 0.4808601 | 0.1514679 | -0.4397818 | -0.2953151 | 0.5912488 | 0.2961831 | 0.4999322 | 0.7853981 | 1.4895000 |
| | 1.0651565 | 0.2454321 | 0.4817878 | 2.1289053 | 2.3638697 | 1.0377579 | 0.8512723 | | | | | |
| 537 | 0.5650634 | 0.5650632 | 0.8490002 | 0.4799232 | 0.1511468 | -0.4407073 | -0.2958896 | 0.5918541 | 0.2964268 | 0.4999058 | 0.7853981 | 1.4875536 |
| | 1.0636535 | 0.2458652 | 0.4812676 | 2.1289625 | 2.3643684 | 1.0367680 | 0.8500599 | | | | | |
| 538 | 0.5642044 | 0.5642042 | 0.8483727 | 0.4789864 | 0.1508266 | -0.4416323 | -0.2964813 | 0.5924588 | 0.2966710 | 0.4998792 | 0.7853981 | 1.4856129 |
| | 1.0621510 | 0.2463070 | 0.4807464 | 2.1290198 | 2.3648672 | 1.0357790 | 0.8488472 | | | | | |
| 539 | 0.5633425 | 0.5633422 | 0.8477437 | 0.4780492 | 0.1505063 | -0.4425462 | -0.2970568 | 0.5930525 | 0.2969157 | 0.4998528 | 0.7853981 | 1.4837103 |
| | 1.0606425 | 0.2467452 | 0.4802244 | 2.1290760 | 2.3653717 | 1.0347872 | 0.8476301 | | | | | |
| 540 | 0.5624846 | 0.5624837 | 0.8471144 | 0.4771122 | 0.1501861 | -0.4434735 | -0.2976403 | 0.5936586 | 0.2971578 | 0.4998263 | 0.7853981 | 1.4817715 |
| | 1.0591382 | 0.2471840 | 0.4797018 | 2.1291332 | 2.3658714 | 1.0337963 | 0.8464182 | | | | | |
| 541 | 0.5616226 | 0.5616224 | 0.8464822 | 0.4761747 | 0.1498659 | -0.4443871 | -0.2982153 | 0.5942530 | 0.2973992 | 0.4997998 | 0.7853981 | 1.4798746 |
| | 1.0576256 | 0.2476226 | 0.4791790 | 2.1291914 | 2.3663750 | 1.0328136 | 0.8452022 | | | | | |
| 542 | 0.5607613 | 0.5607611 | 0.8458499 | 0.4752373 | 0.1495457 | -0.4453043 | -0.2987923 | 0.5948500 | 0.2976404 | 0.4997737 | 0.7853981 | 1.4779711 |
| | 1.0561205 | 0.2480617 | 0.4786553 | 2.1292496 | 2.3668785 | 1.0318098 | 0.8439862 | | | | | |
| 543 | 0.5598996 | 0.5598554 | 0.8452182 | 0.4742591 | 0.1492254 | -0.4462214 | -0.2993690 | 0.5954468 | 0.2978826 | 0.4997472 | 0.7853981 | 1.4760723 |
| | 1.0546112 | 0.2485026 | 0.4781297 | 2.1293077 | 2.3673840 | 1.0308170 | 0.8427697 | | | | | |
| 544 | 0.5590391 | 0.5590394 | 0.8445840 | 0.4733615 | 0.1489052 | -0.4471424 | -0.2999460 | 0.5960476 | 0.2981212 | 0.4997212 | 0.7853981 | 1.4741640 |
| | 1.0531025 | 0.2489426 | 0.4776047 | 2.1293669 | 2.3678875 | 1.0298223 | 0.8415557 | | | | | |
| 545 | 0.5581753 | 0.5581750 | 0.8439496 | 0.4724231 | 0.1485853 | -0.4480497 | -0.3005179 | 0.5966347 | 0.2983626 | 0.4996946 | 0.7853981 | 1.4723034 |
| | 1.0515881 | 0.2493837 | 0.4770782 | 2.1294250 | 2.3683968 | 1.0288277 | 0.8403353 | | | | | |
| 546 | 0.5573135 | 0.5573137 | 0.8433145 | 0.4714845 | 0.1482648 | -0.4489676 | -0.3010845 | 0.5972323 | 0.2986014 | 0.4996686 | 0.7853981 | 1.4704113 |
| | 1.0500784 | 0.2498252 | 0.4765511 | 2.1294951 | 2.3689032 | 1.0278330 | 0.8391193 | | | | | |
| 547 | 0.5564516 | 0.5564514 | 0.8426768 | 0.4705464 | 0.1479445 | -0.4498791 | -0.3016667 | 0.5978236 | 0.2988386 | 0.4996425 | 0.7853981 | 1.4685431 |
| | 1.0485645 | 0.2502667 | 0.4760238 | 2.1295452 | 2.3694105 | 1.0268364 | 0.8379020 | | | | | |
| 548 | 0.5555887 | 0.5555884 | 0.8420387 | 0.4696079 | 0.1476243 | -0.4507926 | -0.3022403 | 0.5984169 | 0.2990755 | 0.4996164 | 0.7853981 | 1.4666719 |
| | 1.0470505 | 0.2507086 | 0.4754957 | 2.1296053 | 2.3699188 | 1.0258389 | 0.8366838 | | | | | |
| 549 | 0.5547244 | 0.5547242 | 0.8414009 | 0.4685691 | 0.1473041 | -0.4517003 | -0.3028053 | 0.5990043 | 0.2993140 | 0.4995903 | 0.7853981 | 1.4648228 |
| | 1.0455351 | 0.2511517 | 0.4749661 | 2.1296654 | 2.3704301 | 1.0248423 | 0.8354635 | | | | | |
| 550 | 0.5538605 | 0.5538603 | 0.8407618 | 0.4677299 | 0.1469839 | -0.4526126 | -0.3033814 | 0.5995965 | 0.2995508 | 0.4995642 | 0.7853981 | 1.4629622 |
| | 1.0440187 | 0.2515951 | 0.4744358 | 2.1297264 | 2.3709412 | 1.0238447 | 0.8342443 | | | | | |
| 551 | 0.5529965 | 0.5529962 | 0.8401221 | 0.4667906 | 0.1466636 | -0.4535247 | -0.3039532 | 0.6001883 | 0.2997874 | 0.4995381 | 0.7853981 | 1.4611053 |
| | 1.0425024 | 0.2520393 | 0.4739046 | 2.1297874 | 2.3714523 | 1.0228462 | 0.8330241 | | | | | |
| 552 | 0.5521321 | 0.5521319 | 0.8394811 | 0.4658514 | 0.1463434 | -0.4544364 | -0.3045247 | 0.6007758 | 0.3000228 | 0.4995120 | 0.7853981 | 1.4592524 |
| | 1.0409861 | 0.2524835 | 0.4733731 | 2.1298485 | 2.3719635 | 1.0218477 | 0.8318041 | | | | | |
| 553 | 0.5512655 | 0.5512657 | 0.8388369 | 0.4649117 | 0.1460232 | -0.4553422 | -0.3050921 | 0.6013653 | 0.3002566 | 0.4994859 | 0.7853981 | 1.4574213 |
| | 1.0394650 | 0.2529274 | 0.4728415 | 2.1299095 | 2.3724766 | 1.0208464 | 0.8305812 | | | | | |
| 554 | 0.5504018 | 0.5504016 | 0.8381932 | 0.4639722 | 0.1457033 | -0.4562520 | -0.3056617 | 0.6019549 | 0.3004894 | 0.4994602 | 0.7853981 | 1.4555807 |
| | 1.0379467 | 0.2533723 | 0.4723087 | 2.1299715 | 2.3729897 | 1.0198460 | 0.8293613 | | | | | |
| 555 | 0.5495358 | 0.5495355 | 0.8375511 | 0.4630322 | 0.1453827 | -0.4571534 | -0.3062257 | 0.6025361 | 0.3007250 | 0.4994341 | 0.7853981 | 1.4537706 |
| | 1.0364256 | 0.2538189 | 0.4717739 | 2.1300344 | 2.3735075 | 1.0188465 | 0.8281387 | | | | | |
| 556 | 0.5486650 | 0.5486647 | 0.8369055 | 0.4620920 | 0.1450625 | -0.4580601 | -0.3067932 | 0.6031227 | 0.3009582 | 0.4994084 | 0.7853981 | 1.4519453 |
| | 1.0349026 | 0.2542649 | 0.4712393 | 2.1300974 | 2.3740225 | 1.0178442 | 0.8269151 | | | | | |
| 557 | 0.5478033 | 0.5478033 | 0.8362608 | 0.4611515 | 0.1447423 | -0.4589712 | -0.3073630 | 0.6037135 | 0.3011911 | 0.4993823 | 0.7853981 | 1.4501104 |
| | 1.0333824 | 0.2547125 | 0.4707030 | 2.1301603 | 2.3745384 | 1.0168428 | 0.8256934 | | | | | |
| 558 | 0.5469357 | 0.5469355 | 0.8356140 | 0.4602110 | 0.1444221 | -0.4598678 | -0.3079297 | 0.6042859 | 0.3014236 | 0.4993566 | 0.7853981 | 1.4483232 |
| | 1.0318565 | 0.2551595 | 0.4701667 | 2.1302233 | 2.3750582 | 1.0158396 | 0.8244683 | | | | | |
| 559 | 0.5460581 | 0.5460578 | 0.8349667 | 0.4592701 | 0.1441018 | -0.4607733 | -0.3084893 | 0.6048751 | 0.3016558 | 0.4993309 | 0.7853981 | 1.4465122 |
| | 1.0303316 | 0.2556077 | 0.4696291 | 2.1302872 | 2.3755770 | 1.0148363 | 0.8232436 | | | | | |
| 560 | 0.5452014 | 0.5452014 | 0.8343183 | 0.4583291 | 0.1437816 | -0.4616768 | -0.3090535 | 0.6054584 | 0.3018861 | 0.4993048 | 0.7853981 | 1.4447107 |
| | 1.0288086 | 0.2560562 | 0.4690908 | 2.1303511 | 2.3760958 | 1.0138330 | 0.8220204 | | | | | |
| 561 | 0.5443349 | 0.5443347 | 0.8336685 | 0.4573880 | 0.1434613 | -0.4625853 | -0.3096209 | 0.6060467 | 0.3021151 | 0.4992794 | 0.7853981 | 1.4428959 |
| | 1.0272837 | 0.2565050 | 0.4685522 | 2.1304150 | 2.3766136 | 1.0128279 | 0.8207971 | | | | | |
| 562 | 0.5434656 | 0.5434654 | 0.8330173 | 0.4564469 | 0.1431412 | -0.4634935 | -0.3101817 | 0.6066247 | 0.3023447 | 0.4992535 | 0.7853981 | 1.4411163 |
| | 1.0257545 | 0.2569538 | 0.4680129 | 2.1304798 | 2.3771353 | 1.0118217 | 0.8195693 | | | | | |
| 563 | 0.5425962 | 0.5425959 | 0.8323652 | 0.4555054 | 0.1428210 | -0.4643805 | -0.3107412 | 0.6072014 | 0.3025737 | 0.4992277 | 0.7853981 | 1.4393425 |
| | 1.0242252 | 0.2574034 | 0.4674727 | 2.1305447 | 2.3776588 | 1.0108156 | 0.8183424 | | | | | |
| 564 | 0.5417276 | 0.5417274 | 0.8317137 | 0.4545637 | 0.1425007 | -0.4652795 | -0.3113019 | 0.6077802 | 0.3028026 | 0.4992023 | 0.7853981 | 1.4375668 |
| | 1.0226965 | 0.2578543 | 0.4669308 | 2.1306105 | 2.3781824 | 1.0098095 | 0.8171164 | | | | | |
| 565 | 0.5408588 | 0.5408577 | 0.8310597 | 0.4536219 | 0.1421804 | -0.4661732 | -0.3118633 | 0.6083606 | 0.3030298 | 0.4991767 | 0.7853981 | 1.4357882 |
| | 1.0211668 | 0.2583048 | 0.4663890 | 2.1306753 | 2.3787059 | 1.0088015 | 0.8158897 | | | | | |
| 566 | 0.5399886 | 0.5399884 | 0.8303967 | 0.4526797 | 0.1418602 | -0.4670589 | -0.3124236 | 0.6089391 | 0.3032581 | 0.4991509 | 0.7853981 | 1.4340181 |
| | 1.0196362 | 0.2587569 | 0.4658453 | 2.1307411 | 2.3792315 | 1.0077953 | 0.8146616 | | | | | |
| 567 | 0.5390242 | 0.5390239 | 0.8297516 | 0.4517374 | 0.1415400 | -0.4679446 | -0.3129836 | 0.6095067 | 0.3034879 | 0.4991229 | 0.7853981 | 1.4322670 |
| | 1.0179386 | 0.2591984 | 0.4653014 | 2.1308155 | 2.3797114 | 1.0067863 | 0.8133332 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.0165663 | 0.2556674 | 0.4647573 | 2.1309356 | 2.3802862 | 1.0057764 | 0.8122004 | 0.6108823 | 0.3037117 | 0.4991000 | 0.7853981 | 1.4305298 |
| 569 | 0.5372813 | 0.5372811 | 0.8284377 | 0.4498524 | 0.1408995 | -0.4693265 | -0.3138155 | 0.6102260 | 0.3039996 | 0.4990718 | 0.7853981 | 1.4300919 |
| | 1.0148681 | 0.2601038 | 0.4642116 | 2.1309490 | 2.3809690 | 1.0047674 | 0.8108400 | | | | | |
| 570 | 0.5364050 | 0.5364048 | 0.8277783 | 0.4489095 | 0.1405793 | -0.4702228 | -0.3143734 | 0.6108021 | 0.3042238 | 0.4990461 | 0.7853981 | 1.4283400 |
| | 1.0133324 | 0.2605566 | 0.4636657 | 2.1310167 | 2.3814974 | 1.0037556 | 0.8096086 | | | | | |
| 571 | 0.5355370 | 0.5355368 | 0.8271195 | 0.4479664 | 0.1402591 | -0.4711128 | -0.3149271 | 0.6113719 | 0.3044484 | 0.4990208 | 0.7853981 | 1.4266050 |
| | 1.0117950 | 0.2610108 | 0.4631183 | 2.1310854 | 2.3820286 | 1.0027447 | 0.8083777 | | | | | |
| 572 | 0.5346646 | 0.5346644 | 0.8264593 | 0.4471234 | 0.1399389 | -0.4720044 | -0.3154812 | 0.6119433 | 0.3046719 | 0.4989954 | 0.7853981 | 1.4248753 |
| | 1.0102577 | 0.2614649 | 0.4625705 | 2.1311531 | 2.3825588 | 1.0017328 | 0.8071464 | | | | | |
| 573 | 0.5337914 | 0.5337911 | 0.8257984 | 0.4462795 | 0.1396196 | -0.4728935 | -0.3160434 | 0.6125121 | 0.3048957 | 0.4989702 | 0.7853981 | 1.4231529 |
| | 1.0087185 | 0.2619203 | 0.4620212 | 2.1312218 | 2.3830919 | 1.0007200 | 0.8059137 | | | | | |
| 574 | 0.5329197 | 0.5329195 | 0.8251383 | 0.4454360 | 0.1392984 | -0.4737898 | -0.3166008 | 0.6130882 | 0.3051189 | 0.4989448 | 0.7853981 | 1.4214115 |
| | 1.0071821 | 0.2623768 | 0.4614706 | 2.1312904 | 2.3836241 | 0.9997072 | 0.8046824 | | | | | |
| 575 | 0.5320441 | 0.5320445 | 0.8244748 | 0.4445918 | 0.1389782 | -0.4746749 | -0.3171405 | 0.6136531 | 0.3053415 | 0.4989195 | 0.7853981 | 1.4197073 |
| | 1.0056391 | 0.2628326 | 0.4609209 | 2.1313611 | 2.3841591 | 0.9986948 | 0.8034482 | | | | | |
| 576 | 0.5311726 | 0.5311723 | 0.8238125 | 0.4437477 | 0.1386590 | -0.4755701 | -0.3176964 | 0.6142281 | 0.3055632 | 0.4988942 | 0.7853981 | 1.4179745 |
| | 1.0041008 | 0.2632902 | 0.4603676 | 2.1314297 | 2.3846922 | 0.9976820 | 0.8022173 | | | | | |
| 577 | 0.5302977 | 0.5302975 | 0.8231490 | 0.4429032 | 0.1383377 | -0.4764542 | -0.3182457 | 0.6147919 | 0.3057855 | 0.4988689 | 0.7853981 | 1.4162388 |
| | 1.0025578 | 0.2637480 | 0.4598145 | 2.1314993 | 2.3852311 | 0.9966681 | 0.8009824 | | | | | |
| 578 | 0.5294220 | 0.5294218 | 0.8224830 | 0.4413581 | 0.1380175 | -0.4773378 | -0.3187931 | 0.6153553 | 0.3060062 | 0.4988436 | 0.7853981 | 1.4145861 |
| | 1.0010128 | 0.2642057 | 0.4592613 | 2.1315699 | 2.3857679 | 0.9956523 | 0.7997462 | | | | | |
| 579 | 0.5285477 | 0.5285475 | 0.8218157 | 0.4404141 | 0.1376973 | -0.4782285 | -0.3193455 | 0.6159258 | 0.3062246 | 0.4988186 | 0.7853981 | 1.4128761 |
| | 0.9994700 | 0.2646637 | 0.4587074 | 2.1316404 | 2.3863039 | 0.9946355 | 0.7985122 | | | | | |
| 580 | 0.5276725 | 0.5276723 | 0.8211485 | 0.4394690 | 0.1373771 | -0.4791184 | -0.3198971 | 0.6164955 | 0.3064443 | 0.4987932 | 0.7853981 | 1.4111700 |
| | 0.9979261 | 0.2651232 | 0.4581516 | 2.1317110 | 2.3868418 | 0.9936193 | 0.7972769 | | | | | |
| 581 | 0.5267966 | 0.5267964 | 0.8204815 | 0.4385235 | 0.1370568 | -0.4800001 | -0.3204433 | 0.6170570 | 0.3066640 | 0.4987683 | 0.7853981 | 1.4094915 |
| | 0.9963781 | 0.2655836 | 0.4575947 | 2.1317815 | 2.3873835 | 0.9926127 | 0.7960406 | | | | | |
| 582 | 0.5259202 | 0.5259200 | 0.8198143 | 0.4375781 | 0.1367366 | -0.4808811 | -0.3209888 | 0.6176177 | 0.3068843 | 0.4987430 | 0.7853981 | 1.4078188 |
| | 0.9948327 | 0.2660446 | 0.4570367 | 2.1318541 | 2.3879261 | 0.9915867 | 0.7948035 | | | | | |
| 583 | 0.5250456 | 0.5250456 | 0.8191429 | 0.4366327 | 0.1364164 | -0.4817749 | -0.3215423 | 0.6181913 | 0.3070991 | 0.4987181 | 0.7853981 | 1.4061089 |
| | 0.9932875 | 0.2665048 | 0.4564794 | 2.1319265 | 2.3884630 | 0.9905671 | 0.7935693 | | | | | |
| 584 | 0.5241680 | 0.5241677 | 0.8184710 | 0.4356871 | 0.1360962 | -0.4826577 | -0.3220887 | 0.6187539 | 0.3073158 | 0.4986932 | 0.7853981 | 1.4044361 |
| | 0.9917377 | 0.2669656 | 0.4559209 | 2.1319990 | 2.3890057 | 0.9895473 | 0.7923303 | | | | | |
| 585 | 0.5232906 | 0.5232903 | 0.8177968 | 0.4347408 | 0.1357759 | -0.4835374 | -0.3226328 | 0.6193133 | 0.3075303 | 0.4986682 | 0.7853981 | 1.4027739 |
| | 0.9901865 | 0.2674268 | 0.4553617 | 2.1320724 | 2.3895493 | 0.9885255 | 0.7910919 | | | | | |
| 586 | 0.5224125 | 0.5224122 | 0.8171239 | 0.4337949 | 0.1354557 | -0.4844161 | -0.3231761 | 0.6198719 | 0.3077463 | 0.4986432 | 0.7853981 | 1.4011183 |
| | 0.9886357 | 0.2678890 | 0.4548011 | 2.1321459 | 2.3900948 | 0.9875053 | 0.7898525 | | | | | |
| 587 | 0.5215340 | 0.5215338 | 0.8164501 | 0.4328483 | 0.1351355 | -0.4852914 | -0.3237168 | 0.6204268 | 0.3079619 | 0.4986183 | 0.7853981 | 1.3994751 |
| | 0.9870821 | 0.2683524 | 0.4542391 | 2.1322203 | 2.3906422 | 0.9864843 | 0.7886127 | | | | | |
| 588 | 0.5206562 | 0.5206561 | 0.8157747 | 0.4319017 | 0.1348153 | -0.4861800 | -0.3242662 | 0.6209953 | 0.3081755 | 0.4985934 | 0.7853981 | 1.3977547 |
| | 0.9855312 | 0.2688158 | 0.4536766 | 2.1322947 | 2.3911858 | 0.9854623 | 0.7873739 | | | | | |
| 589 | 0.5197763 | 0.5197760 | 0.8150982 | 0.4309546 | 0.1344950 | -0.4870544 | -0.3248060 | 0.6215494 | 0.3083897 | 0.4985685 | 0.7853981 | 1.3961582 |
| | 0.9839755 | 0.2692798 | 0.4531131 | 2.1323691 | 2.3917351 | 0.9844393 | 0.7861317 | | | | | |
| 590 | 0.5188966 | 0.5188962 | 0.8144208 | 0.4300076 | 0.1341748 | -0.4879342 | -0.3253494 | 0.6221090 | 0.3086029 | 0.4985435 | 0.7853981 | 1.3945093 |
| | 0.9824203 | 0.2697443 | 0.4525489 | 2.1324434 | 2.3922834 | 0.9834158 | 0.7848899 | | | | | |
| 591 | 0.5180178 | 0.5180176 | 0.8137427 | 0.4290603 | 0.1338546 | -0.4888099 | -0.3258896 | 0.6226645 | 0.3088147 | 0.4985189 | 0.7853981 | 1.3928757 |
| | 0.9808654 | 0.2702096 | 0.4519835 | 2.1325197 | 2.3928328 | 0.9823919 | 0.7836499 | | | | | |
| 592 | 0.5171376 | 0.5171373 | 0.8130648 | 0.4281127 | 0.1335344 | -0.4896879 | -0.3264312 | 0.6232222 | 0.3090279 | 0.4984940 | 0.7853981 | 1.3912363 |
| | 0.9793085 | 0.2706761 | 0.4514166 | 2.1325941 | 2.3933840 | 0.9813684 | 0.7824075 | | | | | |
| 593 | 0.5162562 | 0.5162561 | 0.8123856 | 0.4271645 | 0.1332141 | -0.4905605 | -0.3269692 | 0.6237746 | 0.3092407 | 0.4984695 | 0.7853981 | 1.3896160 |
| | 0.9777485 | 0.2711434 | 0.4508484 | 2.1326714 | 2.3939381 | 0.9803437 | 0.7811637 | | | | | |
| 594 | 0.5153764 | 0.5153762 | 0.8117052 | 0.4262168 | 0.1328939 | -0.4914398 | -0.3275111 | 0.6243337 | 0.3094512 | 0.4984449 | 0.7853981 | 1.3879786 |
| | 0.9761916 | 0.2716105 | 0.4502801 | 2.1327477 | 2.3944933 | 0.9793185 | 0.7799219 | | | | | |
| 595 | 0.5144965 | 0.5144963 | 0.8110220 | 0.4252686 | 0.1325737 | -0.4923138 | -0.3280497 | 0.6248875 | 0.3096607 | 0.4984200 | 0.7853981 | 1.3863592 |
| | 0.9746317 | 0.2720776 | 0.4497114 | 2.1328239 | 2.3950424 | 0.9782910 | 0.7786772 | | | | | |
| 596 | 0.5136130 | 0.5136127 | 0.8103395 | 0.4243200 | 0.1322535 | -0.4931840 | -0.3285854 | 0.6254375 | 0.3098704 | 0.4983954 | 0.7853981 | 1.3847542 |
| | 0.9731704 | 0.2725461 | 0.4491410 | 2.1329012 | 2.3955984 | 0.9772640 | 0.7774330 | | | | | |
| 597 | 0.5127315 | 0.5127313 | 0.8096576 | 0.4233712 | 0.1319332 | -0.4940594 | -0.3291243 | 0.6259527 | 0.3100811 | 0.4983709 | 0.7853981 | 1.3831348 |
| | 0.9715103 | 0.2730161 | 0.4485687 | 2.1329794 | 2.3961544 | 0.9762380 | 0.7761889 | | | | | |
| 598 | 0.5118486 | 0.5118484 | 0.8089734 | 0.4224223 | 0.1316130 | -0.4949294 | -0.3296598 | 0.6265424 | 0.3102903 | 0.4983463 | 0.7853981 | 1.3815346 |
| | 0.9699455 | 0.2734859 | 0.4479961 | 2.1330576 | 2.3967133 | 0.9752101 | 0.7749429 | | | | | |
| 599 | 0.5109658 | 0.5109656 | 0.8082874 | 0.4214730 | 0.1312928 | -0.4958061 | -0.3301891 | 0.6270989 | 0.3104979 | 0.4983217 | 0.7853981 | 1.3799181 |
| | 0.9683826 | 0.2739561 | 0.4474229 | 2.1331358 | 2.3972692 | 0.9741808 | 0.7736979 | | | | | |
| 600 | 0.5100820 | 0.5100818 | 0.8076020 | 0.4205235 | 0.1309726 | -0.4966715 | -0.3307309 | 0.6276441 | 0.3107048 | 0.4982972 | 0.7853981 | 1.3783360 |
| | 0.9668167 | 0.2744276 | 0.4468479 | 2.1332151 | 2.3978319 | 0.9731522 | 0.7724496 | | | | | |
| 601 | 0.5091980 | 0.5091986 | 0.8069141 | 0.4195738 | 0.1306523 | -0.4975451 | -0.3312680 | 0.6281974 | 0.3109130 | 0.4982726 | 0.7853981 | 1.3767319 |
| | 0.9652518 | 0.2748989 | 0.4462727 | 2.1332941 | 2.3983998 | 0.9721217 | 0.7712033 | | | | | |
| 602 | 0.5083144 | 0.5083141 | 0.8062262 | 0.4186240 | 0.1303321 | -0.4984008 | -0.3317992 | 0.6287419 | 0.3111202 | 0.4982485 | 0.7853981 | 1.3751564 |
| | 0.9636841 | 0.2753713 | 0.4456962 | 2.1333742 | 2.3989525 | 0.9710913 | 0.7699549 | | | | | |
| 603 | 0.5174301 | 0.5074298 | 0.8055363 | 0.4176739 | 0.1300119 | -0.4992790 | -0.3323328 | 0.6292868 | 0.3113253 | 0.4982239 | 0.7853981 | 1.3735704 |
| | 0.9621164 | 0.2758439 | 0.4451190 | 2.1334543 | 2.3995142 | 0.9700595 | 0.7687070 | | | | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 604 | 0.5065451 | 0.5065448 | 0.8048472 | 0.4167236 | 0.1296917 | -0.5001454 | -0.3228648 | 0.6298370 | 0.3115317 | 0.4981994 | 0.7853981 | 1.3719959 |
| | 0.9605482 | 0.2763177 | 0.4445401 | 2.1335344 | 2.4000780 | 0.9690285 | 0.7674581 | | | | | |
| 605 | 0.5056597 | 0.5056595 | 0.8041551 | 0.4157727 | 0.1293714 | -0.5010130 | -0.3333969 | 0.6303844 | 0.3117356 | 0.4981752 | 0.7853981 | 1.3704185 |
| | 0.9589775 | 0.2767517 | 0.4439607 | 2.1336155 | 2.4006433 | 0.9679949 | 0.7662085 | | | | | |
| 606 | 0.5047733 | 0.5047731 | 0.8034638 | 0.4148220 | 0.1290512 | -0.5018764 | -0.3339267 | 0.6309276 | 0.3119408 | 0.4981510 | 0.7853981 | 1.3688564 |
| | 0.9574054 | 0.2772667 | 0.4433799 | 2.1336975 | 2.4012108 | 0.9669623 | 0.7649575 | | | | | |
| 607 | 0.5038877 | 0.5038875 | 0.8027699 | 0.4138711 | 0.1287310 | -0.5027456 | -0.3344555 | 0.6314776 | 0.3121433 | 0.4981264 | 0.7853981 | 1.3672890 |
| | 0.9558355 | 0.2777416 | 0.4427989 | 2.1337786 | 2.4017754 | 0.9659278 | 0.7637073 | | | | | |
| 608 | 0.5030016 | 0.5030016 | 0.8020757 | 0.4129199 | 0.1284108 | -0.5036119 | -0.3349503 | 0.6320226 | 0.3123457 | 0.4981022 | 0.7853981 | 1.3657150 |
| | 0.9542628 | 0.2782176 | 0.4422163 | 2.1338615 | 2.4023428 | 0.9648931 | 0.7624576 | | | | | |
| 609 | 0.5021133 | 0.5021130 | 0.8013785 | 0.4119681 | 0.1280905 | -0.5044740 | -0.3355178 | 0.6325635 | 0.3125472 | 0.4980781 | 0.7853981 | 1.3641653 |
| | 0.9526863 | 0.2786934 | 0.4416334 | 2.1339445 | 2.4029121 | 0.9638559 | 0.7612037 | | | | | |
| 610 | 0.5012270 | 0.5012268 | 0.8006837 | 0.4110163 | 0.1277703 | -0.5053387 | -0.3360480 | 0.6331090 | 0.3127494 | 0.4980539 | 0.7853981 | 1.3626070 |
| | 0.9511132 | 0.2791714 | 0.4410481 | 2.1340275 | 2.4034824 | 0.9628211 | 0.7599530 | | | | | |
| 611 | 0.5003393 | 0.5003390 | 0.7999880 | 0.4100640 | 0.1274500 | -0.5062008 | -0.3365756 | 0.6336508 | 0.3129519 | 0.4980297 | 0.7853981 | 1.3610601 |
| | 0.9495377 | 0.2796502 | 0.4404616 | 2.1341114 | 2.4040546 | 0.9617856 | 0.7587001 | | | | | |
| 612 | 0.4994501 | 0.4994499 | 0.7992913 | 0.4091117 | 0.1271299 | -0.5070601 | -0.3371013 | 0.6341899 | 0.3131543 | 0.4980056 | 0.7853981 | 1.3595228 |
| | 0.9479656 | 0.2801295 | 0.4398741 | 2.1341944 | 2.4046288 | 0.9607496 | 0.7574453 | | | | | |
| 613 | 0.4985622 | 0.4985620 | 0.7985921 | 0.4081594 | 0.1268096 | -0.5079188 | -0.3376264 | 0.6347284 | 0.3133536 | 0.4979817 | 0.7853981 | 1.3579903 |
| | 0.9463917 | 0.2806084 | 0.4392865 | 2.1342793 | 2.4052029 | 0.9597115 | 0.7561925 | | | | | |
| 614 | 0.4976731 | 0.4976729 | 0.7978913 | 0.4072065 | 0.1264894 | -0.5087789 | -0.3381520 | 0.6352683 | 0.3135523 | 0.4979576 | 0.7853981 | 1.3564558 |
| | 0.9448215 | 0.2810891 | 0.4386978 | 2.1343651 | 2.4057779 | 0.9586722 | 0.7549376 | | | | | |
| 615 | 0.4967830 | 0.4967828 | 0.7971904 | 0.4062535 | 0.1261691 | -0.5096395 | -0.3386781 | 0.6358086 | 0.3137517 | 0.4979334 | 0.7853981 | 1.3549223 |
| | 0.9432515 | 0.2815687 | 0.4381077 | 2.1344500 | 2.4063530 | 0.9576330 | 0.7536816 | | | | | |
| 616 | 0.4958935 | 0.4958932 | 0.7964892 | 0.4053002 | 0.1258489 | -0.5104962 | -0.3392012 | 0.6363451 | 0.3139504 | 0.4979096 | 0.7853981 | 1.3534721 |
| | 0.9416803 | 0.2820504 | 0.4375163 | 2.1345367 | 2.4069309 | 0.9565938 | 0.7524264 | | | | | |
| 617 | 0.4950032 | 0.4950030 | 0.7957875 | 0.4043466 | 0.1255287 | -0.5113556 | -0.3397260 | 0.6368843 | 0.3141491 | 0.4978858 | 0.7853981 | 1.3518763 |
| | 0.9400984 | 0.2825329 | 0.4369234 | 2.1346226 | 2.4075098 | 0.9555543 | 0.7511711 | | | | | |
| 618 | 0.4941122 | 0.4941120 | 0.7950838 | 0.4033928 | 0.1252085 | -0.5122139 | -0.3402469 | 0.6374224 | 0.3143466 | 0.4978617 | 0.7853981 | 1.3503561 |
| | 0.9384760 | 0.2830156 | 0.4363301 | 2.1347084 | 2.4080887 | 0.9545133 | 0.7499129 | | | | | |
| 619 | 0.4932211 | 0.4932209 | 0.7943777 | 0.4024386 | 0.1248882 | -0.5130689 | -0.3407712 | 0.6379571 | 0.3145429 | 0.4978378 | 0.7853981 | 1.3488474 |
| | 0.9368908 | 0.2834986 | 0.4357359 | 2.1347961 | 2.4086695 | 0.9534703 | 0.7486553 | | | | | |
| 620 | 0.4923293 | 0.4923293 | 0.7936710 | 0.4014847 | 0.1245680 | -0.5139266 | -0.3412944 | 0.6384946 | 0.3147368 | 0.4978141 | 0.7853981 | 1.3473330 |
| | 0.9353052 | 0.2839817 | 0.4351413 | 2.1348835 | 2.4092503 | 0.9524271 | 0.7473972 | | | | | |
| 621 | 0.4914368 | 0.4914365 | 0.7929636 | 0.4005300 | 0.1242478 | -0.5147781 | -0.3418133 | 0.6390259 | 0.3149322 | 0.4977902 | 0.7853981 | 1.3458085 |
| | 0.9337181 | 0.2844661 | 0.4345448 | 2.1349716 | 2.4098339 | 0.9513834 | 0.7461374 | | | | | |
| 622 | 0.4905444 | 0.4905441 | 0.7922553 | 0.3995754 | 0.1239276 | -0.5156320 | -0.3423336 | 0.6395596 | 0.3151265 | 0.4977665 | 0.7853981 | 1.3443394 |
| | 0.9321300 | 0.2849512 | 0.4339473 | 2.1350613 | 2.4104185 | 0.9503392 | 0.7448782 | | | | | |
| 623 | 0.4896517 | 0.4896514 | 0.7915455 | 0.3986274 | 0.1236073 | -0.5164872 | -0.3428543 | 0.6400946 | 0.3153201 | 0.4977427 | 0.7853981 | 1.3428383 |
| | 0.9305426 | 0.2854369 | 0.4333498 | 2.1351500 | 2.4110022 | 0.9492941 | 0.7436185 | | | | | |
| 624 | 0.4887581 | 0.4887578 | 0.7908351 | 0.3976652 | 0.1232871 | -0.5173398 | -0.3433734 | 0.6406279 | 0.3155128 | 0.4977189 | 0.7853981 | 1.3413477 |
| | 0.9289525 | 0.2859230 | 0.4327494 | 2.1352396 | 2.4115887 | 0.9482481 | 0.7423576 | | | | | |
| 625 | 0.4878634 | 0.4878634 | 0.7901234 | 0.3967099 | 0.1229669 | -0.5181890 | -0.3438859 | 0.6411559 | 0.3157055 | 0.4976951 | 0.7853981 | 1.3398676 |
| | 0.9273602 | 0.2864098 | 0.4321488 | 2.1353292 | 2.4121771 | 0.9472016 | 0.7411954 | | | | | |
| 626 | 0.4869695 | 0.4869696 | 0.7894129 | 0.3957538 | 0.1226467 | -0.5190434 | -0.3444099 | 0.6416901 | 0.3158987 | 0.4976717 | 0.7853981 | 1.3383760 |
| | 0.9257656 | 0.2868587 | 0.4315457 | 2.1354198 | 2.4127655 | 0.9461561 | 0.7398343 | | | | | |
| 627 | 0.4860746 | 0.4860746 | 0.7887008 | 0.3947976 | 0.1223264 | -0.5198920 | -0.3449258 | 0.6422185 | 0.3160916 | 0.4976478 | 0.7853981 | 1.3369017 |
| | 0.9241770 | 0.2873478 | 0.4309420 | 2.1355104 | 2.4133568 | 0.9451095 | 0.7385713 | | | | | |
| 628 | 0.4851800 | 0.4851798 | 0.7879874 | 0.3938414 | 0.1220062 | -0.5207399 | -0.3454419 | 0.6427461 | 0.3162830 | 0.4976245 | 0.7853981 | 1.3354321 |
| | 0.9225882 | 0.2878375 | 0.4303374 | 2.1356030 | 2.4139490 | 0.9440622 | 0.7373087 | | | | | |
| 629 | 0.4842845 | 0.4842846 | 0.7872730 | 0.3928847 | 0.1216860 | -0.5215892 | -0.3459567 | 0.6432751 | 0.3164738 | 0.4976006 | 0.7853981 | 1.3339605 |
| | 0.9209885 | 0.2883279 | 0.4297314 | 2.1356945 | 2.4145412 | 0.9431140 | 0.7360456 | | | | | |
| 630 | 0.4833805 | 0.4833802 | 0.7865579 | 0.3919278 | 0.1213658 | -0.5224360 | -0.3464710 | 0.6438018 | 0.3166648 | 0.4975773 | 0.7853981 | 1.3324976 |
| | 0.9193925 | 0.2888592 | 0.4291241 | 2.1357870 | 2.4151363 | 0.9419653 | 0.7347808 | | | | | |
| 631 | 0.4824527 | 0.4824522 | 0.7858409 | 0.3909708 | 0.1210455 | -0.5232875 | -0.3469879 | 0.6443331 | 0.3168538 | 0.4975538 | 0.7853981 | 1.3310242 |
| | 0.9177961 | 0.2893506 | 0.4285163 | 2.1358795 | 2.4157305 | 0.9409153 | 0.7335166 | | | | | |
| 632 | 0.4815955 | 0.4815956 | 0.7851240 | 0.3900133 | 0.1207253 | -0.5241356 | -0.3475024 | 0.6448609 | 0.3170425 | 0.4975303 | 0.7853981 | 1.3295622 |
| | 0.9161987 | 0.2898434 | 0.4279067 | 2.1359730 | 2.4163255 | 0.9398656 | 0.7322515 | | | | | |
| 633 | 0.4806978 | 0.4806976 | 0.7844043 | 0.3890556 | 0.1204051 | -0.5249809 | -0.3480151 | 0.6453860 | 0.3172316 | 0.4975066 | 0.7853981 | 1.3281107 |
| | 0.9145985 | 0.2903361 | 0.4272966 | 2.1360664 | 2.4169245 | 0.9389136 | 0.7309843 | | | | | |
| 634 | 0.4797995 | 0.4797996 | 0.7836838 | 0.3880979 | 0.1200849 | -0.5258225 | -0.3485259 | 0.6459074 | 0.3174186 | 0.4974832 | 0.7853981 | 1.3266697 |
| | 0.9129960 | 0.2908252 | 0.4266856 | 2.1361609 | 2.4175234 | 0.9377611 | 0.7297174 | | | | | |
| 635 | 0.4789026 | 0.4789018 | 0.7829632 | 0.3871398 | 0.1197646 | -0.5266721 | -0.3490401 | 0.6464268 | 0.3176057 | 0.4974598 | 0.7853981 | 1.3252456 |
| | 0.9113975 | 0.2913238 | 0.4260728 | 2.1362562 | 2.4181223 | 0.9367087 | 0.7284506 | | | | | |
| 636 | 0.4780032 | 0.4780030 | 0.7822410 | 0.3861814 | 0.1194444 | -0.5275176 | -0.3495458 | 0.6469529 | 0.3177921 | 0.4974367 | 0.7853981 | 1.3237906 |
| | 0.9097934 | 0.2918187 | 0.4254591 | 2.1363525 | 2.4187260 | 0.9356553 | 0.7271925 | | | | | |
| 637 | 0.4771039 | 0.4771037 | 0.7815174 | 0.3852228 | 0.1191242 | -0.5283532 | -0.3500579 | 0.6474773 | 0.3179773 | 0.4974133 | 0.7853981 | 1.3223457 |
| | 0.9081931 | 0.2923141 | 0.4248444 | 2.1364479 | 2.4193277 | 0.9345917 | 0.7259136 | | | | | |
| 638 | 0.4762045 | 0.4762046 | 0.7807929 | 0.3842643 | 0.1188040 | -0.5292033 | -0.3505704 | 0.6480043 | 0.3181618 | 0.4973899 | 0.7853981 | 1.3208990 |
| | 0.9065872 | 0.2928104 | 0.4242285 | 2.1365442 | 2.4199295 | 0.9335455 | 0.7246451 | | | | | |
| 639 | 0.4753041 | 0.4753038 | 0.7800674 | 0.3833044 | 0.1184837 | -0.5300373 | -0.3510767 | 0.6485210 | 0.3183466 | 0.4973668 | 0.7853981 | 1.3194809 |
| | 0.9049796 | 0.2933077 | 0.4236119 | 2.1366405 | 2.4205360 | 0.9324996 | 0.7233741 | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0.6033342 | 0.2938066 | 0.4229914 | 2.1367388 | 2.4211426 | 0.9314354 | 0.7221445 | | | |
| 641 | 0.4735034 | 0.4735032 | 0.7786156 | 0.3813853 | 0.1178433 | -0.5317196 | -0.3520937 | 0.6495628 | 0.3187147 | 0.4973204 | 0.7853981 | 1.3166294 |
| | 0.5017661 | 0.2943050 | 0.4223719 | 2.1368370 | 2.4217561 | 0.9317779 | 0.7208337 | | | |
| 642 | 0.4726011 | 0.4726015 | 0.7778884 | 0.3804250 | 0.1175230 | -0.5325597 | -0.3526012 | 0.6500827 | 0.3188987 | 0.4972973 | 0.7853981 | 1.3152094 |
| | 0.5021572 | 0.2940649 | 0.4217502 | 2.1369352 | 2.4223595 | 0.9293211 | 0.7195615 | | | |
| 643 | 0.4716957 | 0.4716955 | 0.7771600 | 0.3794647 | 0.1172028 | -0.5333940 | -0.3531948 | 0.6505969 | 0.3190818 | 0.4972743 | 0.7853981 | 1.3138065 |
| | 0.5025470 | 0.2933055 | 0.4211276 | 2.1370315 | 2.4229717 | 0.9282637 | 0.7182989 | | | |
| 644 | 0.4707911 | 0.4707975 | 0.7764307 | 0.3785040 | 0.1169826 | -0.5342362 | -0.3536134 | 0.6511188 | 0.3192640 | 0.4972512 | 0.7853981 | 1.3123856 |
| | 0.5029351 | 0.2930069 | 0.4205035 | 2.1371336 | 2.4235830 | 0.9272055 | 0.7170163 | | | |
| 645 | 0.4699955 | 0.4699952 | 0.7757220 | 0.3775429 | 0.1165624 | -0.5350724 | -0.3541100 | 0.6516348 | 0.3194473 | 0.4972282 | 0.7853981 | 1.3109808 |
| | 0.5033241 | 0.2963055 | 0.4198774 | 2.1372337 | 2.4241972 | 0.9261482 | 0.7157434 | | | |
| 646 | 0.4689922 | 0.4689921 | 0.7749707 | 0.3765615 | 0.1162421 | -0.5359352 | -0.3546203 | 0.6521473 | 0.3196286 | 0.4972051 | 0.7853981 | 1.3095894 |
| | 0.5037106 | 0.2960131 | 0.4192517 | 2.1373348 | 2.4249133 | 0.9250887 | 0.7144691 | | | |
| 647 | 0.4680875 | 0.4680873 | 0.7742375 | 0.3756203 | 0.1159219 | -0.5367374 | -0.3551216 | 0.6526594 | 0.3198095 | 0.4971821 | 0.7853981 | 1.3081999 |
| | 0.5040946 | 0.2973162 | 0.4186233 | 2.1374359 | 2.4254303 | 0.9240282 | 0.7131925 | | | |
| 648 | 0.4671841 | 0.4671844 | 0.7735334 | 0.3746585 | 0.1156017 | -0.5375797 | -0.3556293 | 0.6531814 | 0.3199877 | 0.4971591 | 0.7853981 | 1.3067846 |
| | 0.5044811 | 0.2970202 | 0.4179947 | 2.1375380 | 2.4260445 | 0.9229663 | 0.7119191 | | | |
| 649 | 0.4662800 | 0.4662798 | 0.7727692 | 0.3736966 | 0.1152815 | -0.5384138 | -0.3561317 | 0.6536953 | 0.3201675 | 0.4971361 | 0.7853981 | 1.3053542 |
| | 0.5048660 | 0.2983254 | 0.4173645 | 2.1376390 | 2.4266634 | 0.9219151 | 0.7106428 | | | |
| 650 | 0.4653747 | 0.4653745 | 0.7720339 | 0.3727341 | 0.1149612 | -0.5392444 | -0.3566315 | 0.6542056 | 0.3203468 | 0.4971133 | 0.7853981 | 1.3040152 |
| | 0.5052465 | 0.2988215 | 0.4167326 | 2.1377430 | 2.4272852 | 0.9208429 | 0.7093655 | | | |
| 651 | 0.4644691 | 0.4644689 | 0.7712986 | 0.3717715 | 0.1146419 | -0.5401773 | -0.3571329 | 0.6547183 | 0.3205264 | 0.4970903 | 0.7853981 | 1.3026323 |
| | 0.5056291 | 0.2953288 | 0.4160992 | 2.1378450 | 2.4279070 | 0.9197812 | 0.7080978 | | | |
| 652 | 0.4635641 | 0.4635639 | 0.7705601 | 0.3708087 | 0.1143208 | -0.5411096 | -0.3576334 | 0.6552303 | 0.3207025 | 0.4970676 | 0.7853981 | 1.3012514 |
| | 0.5060095 | 0.2958458 | 0.4154656 | 2.1379455 | 2.4285288 | 0.9187167 | 0.7068111 | | | |
| 653 | 0.4626566 | 0.4626566 | 0.7698204 | 0.3698457 | 0.1140006 | -0.5417386 | -0.3581318 | 0.6557392 | 0.3208769 | 0.4970450 | 0.7853981 | 1.2998819 |
| | 0.5063874 | 0.3003432 | 0.4148305 | 2.1380539 | 2.4291534 | 0.9176514 | 0.7055311 | | | |
| 654 | 0.4617500 | 0.4617457 | 0.7690806 | 0.3688819 | 0.1136803 | -0.5425729 | -0.3586334 | 0.6562532 | 0.3210552 | 0.4970219 | 0.7853981 | 1.2985001 |
| | 0.5067657 | 0.3008625 | 0.4141937 | 2.1381588 | 2.4297781 | 0.9165861 | 0.7042519 | | | |
| 655 | 0.4608425 | 0.4608427 | 0.7683412 | 0.3679183 | 0.1133601 | -0.5434013 | -0.3591311 | 0.6567614 | 0.3212321 | 0.4969992 | 0.7853981 | 1.2971369 |
| | 0.5071425 | 0.3013728 | 0.4135552 | 2.1382647 | 2.4304056 | 0.9155216 | 0.7029724 | | | |
| 656 | 0.4599352 | 0.4599351 | 0.7676009 | 0.3669539 | 0.1130399 | -0.5442313 | -0.3596294 | 0.6572711 | 0.3214087 | 0.4969766 | 0.7853981 | 1.2957697 |
| | 0.5075156 | 0.3018742 | 0.4129149 | 2.1383705 | 2.4310350 | 0.9144563 | 0.7016919 | | | |
| 657 | 0.4590272 | 0.4590270 | 0.7668590 | 0.3659898 | 0.1127197 | -0.5450562 | -0.3601245 | 0.6577758 | 0.3215840 | 0.4969543 | 0.7853981 | 1.2944183 |
| | 0.5078934 | 0.3023559 | 0.4122740 | 2.1384773 | 2.4316664 | 0.9133901 | 0.7004109 | | | |
| 658 | 0.4581184 | 0.4581182 | 0.7661152 | 0.3650249 | 0.1123994 | -0.5458890 | -0.3606237 | 0.6582874 | 0.3217582 | 0.4969313 | 0.7853981 | 1.2930508 |
| | 0.5082684 | 0.3029082 | 0.4116317 | 2.1385841 | 2.4322958 | 0.9123222 | 0.6991289 | | | |
| 659 | 0.4572097 | 0.4572095 | 0.7653716 | 0.3640595 | 0.1120792 | -0.5467164 | -0.3611245 | 0.6587956 | 0.3219326 | 0.4969090 | 0.7853981 | 1.2916937 |
| | 0.5086413 | 0.3034229 | 0.4109876 | 2.1386919 | 2.4329309 | 0.9112548 | 0.6978470 | | | |
| 660 | 0.4563008 | 0.4563003 | 0.7646274 | 0.3630946 | 0.1117589 | -0.5475419 | -0.3616152 | 0.6593009 | 0.3221066 | 0.4968863 | 0.7853981 | 1.2903461 |
| | 0.5090136 | 0.3039365 | 0.4103422 | 2.1388036 | 2.4335642 | 0.9101871 | 0.6965645 | | | |
| 661 | 0.4553902 | 0.4553901 | 0.7638816 | 0.3621290 | 0.1114389 | -0.5483670 | -0.3621057 | 0.6598058 | 0.3222800 | 0.4968640 | 0.7853981 | 1.2890019 |
| | 0.5093833 | 0.3044516 | 0.4096954 | 2.1389193 | 2.4342003 | 0.9091182 | 0.6952816 | | | |
| 662 | 0.4544797 | 0.4544795 | 0.7631359 | 0.3611630 | 0.1111185 | -0.5491915 | -0.3626034 | 0.6603100 | 0.3224540 | 0.4968413 | 0.7853981 | 1.2876808 |
| | 0.5097528 | 0.3049683 | 0.4090467 | 2.1390350 | 2.4348383 | 0.9080495 | 0.6939961 | | | |
| 663 | 0.4535587 | 0.4535585 | 0.7623883 | 0.3601968 | 0.1107983 | -0.5500128 | -0.3630959 | 0.6608111 | 0.3226264 | 0.4968190 | 0.7853981 | 1.2863293 |
| | 0.5101202 | 0.3054651 | 0.4083972 | 2.1391496 | 2.4354782 | 0.9069796 | 0.6927109 | | | |
| 664 | 0.4526581 | 0.4526579 | 0.7616392 | 0.3592312 | 0.1104781 | -0.5508302 | -0.3635894 | 0.6613172 | 0.3227931 | 0.4967963 | 0.7853981 | 1.2849865 |
| | 0.5104893 | 0.3060028 | 0.4077464 | 2.1392643 | 2.4361172 | 0.9059084 | 0.6914265 | | | |
| 665 | 0.4516781 | 0.4516779 | 0.7608891 | 0.3582637 | 0.1101578 | -0.5516491 | -0.3640881 | 0.6618219 | 0.3229532 | 0.4967723 | 0.7853981 | 1.2844839 |
| | 0.5108577 | 0.3065110 | 0.4070944 | 2.1393795 | 2.4367782 | 0.9048367 | 0.6900449 | | | |
| 666 | 0.4508323 | 0.4508321 | 0.7601374 | 0.3572966 | 0.1098376 | -0.5524766 | -0.3645685 | 0.6623142 | 0.3231085 | 0.4967517 | 0.7853981 | 1.2823467 |
| | 0.5112168 | 0.3070357 | 0.4064411 | 2.1394934 | 2.4374046 | 0.9037638 | 0.6888511 | | | |
| 667 | 0.4499522 | 0.4499520 | 0.7593839 | 0.3563293 | 0.1095174 | -0.5533088 | -0.3648687 | 0.6628062 | 0.3233516 | 0.4967276 | 0.7853981 | 1.2810396 |
| | 0.5115604 | 0.3075491 | 0.4057969 | 2.1396045 | 2.4381666 | 0.9026894 | 0.6874696 | | | |
| 668 | 0.4489384 | 0.4489382 | 0.7586302 | 0.3553617 | 0.1091971 | -0.5538179 | -0.3653516 | 0.6630051 | 0.3235204 | 0.4967054 | 0.7853981 | 1.2805214 |
| | 0.5119224 | 0.3080695 | 0.4051309 | 2.1396980 | 2.4386132 | 0.9016151 | 0.6861796 | | | |
| 669 | 0.4480235 | 0.4480233 | 0.7578745 | 0.3543538 | 0.1088769 | -0.5546220 | -0.3658428 | 0.6634985 | 0.3236887 | 0.4966831 | 0.7853981 | 1.2792187 |
| | 0.5122805 | 0.3085926 | 0.4044735 | 2.1398125 | 2.4394627 | 0.9005397 | 0.6848891 | | | |
| 670 | 0.4471091 | 0.4471089 | 0.7571201 | 0.3534254 | 0.1085567 | -0.5554421 | -0.3663332 | 0.6639908 | 0.3238569 | 0.4966608 | 0.7853981 | 1.2779016 |
| | 0.5126541 | 0.3091133 | 0.4038141 | 2.1399260 | 2.4401121 | 0.8994649 | 0.6835993 | | | |
| 671 | 0.4461941 | 0.4461938 | 0.7563642 | 0.3524588 | 0.1082365 | -0.5562596 | -0.3668209 | 0.6644961 | 0.3240249 | 0.4966389 | 0.7853981 | 1.2765932 |
| | 0.5129902 | 0.3096369 | 0.4031533 | 2.1400414 | 2.4407635 | 0.8983894 | 0.6823087 | | | |
| 672 | 0.4452755 | 0.4452752 | 0.7556066 | 0.3514882 | 0.1079162 | -0.5570788 | -0.3673094 | 0.6649950 | 0.3241907 | 0.4966166 | 0.7853981 | 1.2752819 |
| | 0.5133259 | 0.3101607 | 0.4024916 | 2.1401577 | 2.4414148 | 0.8973127 | 0.6810187 | | | |
| 673 | 0.4443623 | 0.4443621 | 0.7548461 | 0.3505190 | 0.1075960 | -0.5578902 | -0.3677931 | 0.6654863 | 0.3243558 | 0.4965947 | 0.7853981 | 1.2739525 |
| | 0.5136613 | 0.3106846 | 0.4018290 | 2.1402740 | 2.4420691 | 0.8962336 | 0.6797351 | | | |
| 674 | 0.4434466 | 0.4434457 | 0.7541885 | 0.3495491 | 0.1072758 | -0.5586960 | -0.3682701 | 0.6659818 | 0.3245232 | 0.4965723 | 0.7853981 | 1.2726936 |
| | 0.5139965 | 0.3112117 | 0.4011626 | 2.1403904 | 2.4427261 | 0.8951572 | 0.6784326 | | | |
| 675 | 0.4425253 | 0.4425250 | 0.7533294 | 0.3485753 | 0.1069556 | -0.5595195 | -0.3687437 | 0.6664751 | 0.3246894 | 0.4965504 | 0.7853981 | 1.2714024 |
| | 0.5143302 | 0.3117391 | 0.4005057 | 2.1405087 | 2.4433842 | 0.8940798 | 0.6771294 | | | |

```
676 0.4416116 0.4416116 0.7525685 0.3476090 0.1066353-0.5603341-0.3692486 0.4669695 0.3248545 0.4965284 0.7853981 1.2791092
    0.8446767 0.3122671 0.3998274 2.1406269 2.4440432 0.8930910 0.6758455
677 0.4406950 0.4406947 0.7518076 0.3466386 0.1063151-0.5611510-0.3697348 0.6674662 0.3250193 0.4965066 0.7853981 1.2688122
    0.8430316 0.3127565 0.3991572 2.1417452 2.4447031 0.8919227 0.6745526
678 0.4397766 0.4397765 0.7510449 0.3456677 0.1059949-0.5619652-0.3702191 0.6679600 0.3251833 0.4964843 0.7853981 1.2675247
    0.8413824 0.3133264 0.3984858 2.1428653 2.4453650 0.8909427 0.6732576
679 0.4388584 0.4388582 0.7502808 0.3446568 0.1056747-0.5627763-0.3707015 0.6684510 0.3253463 0.4964623 0.7853981 1.2662449
    0.8397328 0.3138567 0.3978134 2.1439855 2.4460287 0.8897620 0.6719622
680 0.4379385 0.4379386 0.7495148 0.3437254 0.1053544-0.5635890-0.3711843 0.6689434 0.3255082 0.4964408 0.7853981 1.2649641
    0.8380806 0.3143677 0.3971395 2.1411066 2.4466934 0.8886797 0.6706654
681 0.4370196 0.4370193 0.7487484 0.3427536 0.1051342-0.5644013-0.3716670 0.6694356 0.3256698 0.4964188 0.7853981 1.2636852
    0.8364295 0.3149155 0.3964635 2.1412277 2.4473591 0.8875973 0.6693689
682 0.4360982 0.4360980 0.7479802 0.3417817 0.1047140-0.5652080-0.3721458 0.6699220 0.3258312 0.4963970 0.7853981 1.2624226
    0.8347738 0.3154526 0.3957871 2.1413498 2.4480286 0.8865136 0.6680694
683 0.4351777 0.4351775 0.7472125 0.3408093 0.1043938-0.5660168-0.3726258 0.6704106 0.3259926 0.4963751 0.7853981 1.2611561
    0.8331192 0.3159871 0.3951080 2.1414738 2.4486990 0.8854309 0.6667712
684 0.4342566 0.4342563 0.7464443 0.3398365 0.1040735-0.5668252-0.3731053 0.6708987 0.3261537 0.4963535 0.7853981 1.2598925
    0.8314634 0.3165225 0.3944272 2.1415968 2.4493713 0.8843473 0.6654721
685 0.4333350 0.4333348 0.7456746 0.3388634 0.1037533-0.5676303-0.3735826 0.6713836 0.3263139 0.4963320 0.7853981 1.2586393
    0.8298064 0.3170589 0.3937445 2.1417208 2.4500456 0.8832629 0.6641724
686 0.4324127 0.4324125 0.7449014 0.3378902 0.1034331-0.5684425-0.3740640 0.6718755 0.3264713 0.4963100 0.7853981 1.2573681
    0.8281485 0.3175947 0.3930625 2.1418457 2.4507179 0.8821757 0.6628719
687 0.4314910 0.4314858 0.7441294 0.3369166 0.1031129-0.5692470-0.3745407 0.6723599 0.3266304 0.4962884 0.7853981 1.2561197
    0.8264885 0.3181226 0.3923773 2.1419716 2.4513950 0.8810899 0.6615705
688 0.4305666 0.4305666 0.7433579 0.3359426 0.1027926-0.5700512-0.3750173 0.6728438 0.3267903 0.4962669 0.7853981 1.2548723
    0.8248286 0.3186721 0.3916899 2.1420975 2.4521750 0.8800048 0.6602687
689 0.4296433 0.4296430 0.7425839 0.3349684 0.1024724-0.5708562-0.3754932 0.6733286 0.3269482 0.4962453 0.7853981 1.2536249
    0.8231671 0.3192118 0.3910016 2.1422243 2.4527550 0.8789177 0.6589661
690 0.4287201 0.4287198 0.7418082 0.3339936 0.1021522-0.5716648-0.3759720 0.6738169 0.3271043 0.4962238 0.7853981 1.2523699
    0.8215055 0.3197525 0.3903117 2.1423531 2.4534349 0.8778293 0.6576643
691 0.4277952 0.4277950 0.7410336 0.3330187 0.1018320-0.5724671-0.3764465 0.6742991 0.3272626 0.4962022 0.7853981 1.2511330
    0.8198416 0.3202947 0.3896196 2.1424809 2.4541197 0.8767422 0.6563601
692 0.4268695 0.4268696 0.7402547 0.3320433 0.1015117-0.5732709-0.3769215 0.6747826 0.3274173 0.4961807 0.7853981 1.2498932
    0.8181755 0.3208366 0.3889270 2.1426105 2.4548035 0.8756514 0.6550551
693 0.4259446 0.4259439 0.7394758 0.3310680 0.1011915-0.5740727-0.3773955 0.6752642 0.3275722 0.4961594 0.7853981 1.2486591
    0.8165092 0.3213754 0.3882328 2.1427402 2.4554901 0.8745611 0.6537496
694 0.4250174 0.4250172 0.7386956 0.3300917 0.1008713-0.5748730-0.3778679 0.6757442 0.3277267 0.4961379 0.7853981 1.2474318
    0.8148411 0.3219237 0.3875364 2.1428709 2.4561787 0.8734695 0.6524429
695 0.4240906 0.4240906 0.7379155 0.3291156 0.1005511-0.5756758-0.3783419 0.6762269 0.3278813 0.4961163 0.7853981 1.2461987
    0.8131732 0.3224691 0.3868384 2.1430016 2.4568682 0.8723786 0.6511363
696 0.4231631 0.4231629 0.7371330 0.3281392 0.1002309-0.5764733-0.3788125 0.6767041 0.3280345 0.4960551 0.7853981 1.2449808
    0.8115020 0.3230147 0.3861393 2.1431241 2.4575605 0.8712859 0.6498281
697 0.4222357 0.4222351 0.7363477 0.3271626 0.0999106-0.5772710-0.3792832 0.6771824 0.3281850 0.4960740 0.7853981 1.2437620
    0.8098301 0.3235603 0.3854396 2.1432676 2.4582529 0.8701907 0.6485198
698 0.4213077 0.4213076 0.7355632 0.3261855 0.0995904-0.5780731-0.3797556 0.6776634 0.3283361 0.4960528 0.7853981 1.2425375
    0.8081591 0.3241080 0.3847373 2.1434011 2.4589462 0.8690966 0.6472119
699 0.4203784 0.4203783 0.7347772 0.3252080 0.0992702-0.5788715-0.3802263 0.6781417 0.3284832 0.4960312 0.7853981 1.2413216
    0.8064854 0.3246564 0.3840333 2.1435347 2.4596424 0.8680014 0.6459016
700 0.4194488 0.4194486 0.7339903 0.3242301 0.0989499-0.5796687-0.3806955 0.6786186 0.3286338 0.4960101 0.7853981 1.2401114
    0.8048095 0.3252059 0.3833274 2.1436701 2.4603415 0.8669057 0.6445907
701 0.4185159 0.4185188 0.7332050 0.3232517 0.0986297-0.5804642-0.3811642 0.6790540 0.3287904 0.4959892 0.7853981 1.2389050
    0.8031336 0.3257578 0.3826186 2.1438055 2.4611434 0.8658116 0.6432796
702 0.4175854 0.4175852 0.7324185 0.3222728 0.0983095-0.5812610-0.3816331 0.6795705 0.3289415 0.4959680 0.7853981 1.2376976
    0.8014578 0.3263108 0.3819080 2.1439428 2.4617462 0.8647168 0.6419691
703 0.4166520 0.4166578 0.7316301 0.3212939 0.0979893-0.5820546-0.3820998 0.6800439 0.3290923 0.4959468 0.7853981 1.2364998
    0.7997791 0.3268638 0.3811964 2.1440792 2.4624510 0.8636206 0.6406556
704 0.4157267 0.4157267 0.7308397 0.3203145 0.0976690-0.5828529-0.3825693 0.6805219 0.3292408 0.4959257 0.7853981 1.2352915
    0.7981000 0.3274178 0.3804834 2.1442175 2.4631557 0.8625228 0.6393427
705 0.4147952 0.4147951 0.7300482 0.3193348 0.0973488-0.5836453-0.3830348 0.6809542 0.3293850 0.4959049 0.7853981 1.2340994
    0.7964199 0.3279727 0.3797686 2.1443558 2.4638634 0.8614243 0.6380293
706 0.4138633 0.4138633 0.7292575 0.3183551 0.0970286-0.5844404-0.3835021 0.6814690 0.3295377 0.4958836 0.7853981 1.2329025
    0.7947393 0.3285290 0.3790517 2.1444961 2.4645729 0.8603269 0.6367155
707 0.4129295 0.4129255 0.7284633 0.3173746 0.0967084-0.5852322-0.3839669 0.6819406 0.3296840 0.4958628 0.7853981 1.2317152
    0.7930545 0.3290855 0.3783336 2.1446362 2.4652843 0.8592265 0.6353989
708 0.4119964 0.4119962 0.7276685 0.3163939 0.0963881-0.5860234-0.3844312 0.6824115 0.3298312 0.4958420 0.7853981 1.2305298
    0.7913695 0.3296433 0.3776137 2.1447783 2.4659977 0.8581259 0.6340833
709 0.4110625 0.4110623 0.7268737 0.3154131 0.0960679-0.5868165-0.3848965 0.6828845 0.3299780 0.4958208 0.7853981 1.2293415
    0.7896854 0.3302022 0.3768919 2.1449194 2.4667120 0.8570256 0.6327664
710 0.4101285 0.4101283 0.7260765 0.3144317 0.0957476-0.5876064-0.3853594 0.6833540 0.3301226 0.4957990 0.7853981 1.2281628
    0.7879998 0.3307618 0.3761685 2.1450634 2.4674282 0.8559235 0.6314496
711 0.4091938 0.4091936 0.7252787 0.3134502 0.0954275-0.5883989-0.3858241 0.6838264 0.3302673 0.4957792 0.7853981 1.2269793
    0.7863120 0.3313226 0.3754435 2.1452065 2.4681463 0.8548211 0.6301218
```

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0.7846218 | 0.3318640 | 0.3747166 | 2.1453514 | 2.4688673 | -0.8537171 | -0.6288118 | 0.6842527 | 0.3304111 | 0.4957584 | 0.7853981 | 1.2258110 |
| 713 | 0.4073212 | 0.4073210 | 0.7236806 | 0.3114856 | 0.0947870 | -0.5899719 | -0.3867452 | 0.6847589 | 0.3305566 | 0.4957379 | 0.7853981 | 1.2246447 |
| | 0.7829304 | 0.3324475 | 0.3739871 | 2.1454964 | 2.4695911 | -0.8526149 | -0.6274917 | | | | | |
| 714 | 0.4063854 | 0.4063852 | 0.7228815 | 0.3105025 | 0.0944667 | -0.5907598 | -0.3872961 | 0.6852265 | 0.3307011 | 0.4957170 | 0.7853981 | 1.2234774 |
| | 0.7812401 | 0.3330126 | 0.3732551 | 2.1456432 | 2.4703159 | -0.8515121 | -0.6261725 | | | | | |
| 715 | 0.4054485 | 0.4054483 | 0.7220796 | 0.3095199 | 0.0941465 | -0.5915505 | -0.3876699 | 0.6856970 | 0.3308435 | 0.4956962 | 0.7853981 | 1.2223024 |
| | 0.7795485 | 0.3335771 | 0.3725230 | 2.1457851 | 2.4710407 | -0.8504072 | -0.6248516 | | | | | |
| 716 | 0.4045105 | 0.4045101 | 0.7212757 | 0.3085341 | 0.0938263 | -0.5923356 | -0.3881282 | 0.6861619 | 0.3309855 | 0.4956758 | 0.7853981 | 1.2211437 |
| | 0.7778532 | 0.3341429 | 0.3717887 | 2.1459370 | 2.4717693 | -0.8493007 | -0.6235289 | | | | | |
| 717 | 0.4035720 | 0.4035718 | 0.7204713 | 0.3075523 | 0.0935061 | -0.5931249 | -0.3885897 | 0.6866310 | 0.3311267 | 0.4956550 | 0.7853981 | 1.2199764 |
| | 0.7761585 | 0.3347056 | 0.3710527 | 2.1460848 | 2.4724979 | -0.8481941 | -0.6222062 | | | | | |
| 718 | 0.4026333 | 0.4026333 | 0.7196671 | 0.3065692 | 0.0931858 | -0.5938935 | -0.3890442 | 0.6870894 | 0.3312683 | 0.4956345 | 0.7853981 | 1.2188058 |
| | 0.7744618 | 0.3352780 | 0.3703142 | 2.1462355 | 2.4732323 | -0.8470880 | -0.6208832 | | | | | |
| 719 | 0.4016946 | 0.4016944 | 0.7184615 | 0.3055839 | 0.0928656 | -0.5946894 | -0.3895032 | 0.6875550 | 0.3314052 | 0.4956141 | 0.7853981 | 1.2176290 |
| | 0.7727647 | 0.3358472 | 0.3695742 | 2.1463861 | 2.4739656 | -0.8459810 | -0.6195597 | | | | | |
| 720 | 0.4007556 | 0.4007549 | 0.7180534 | 0.3045989 | 0.0925454 | -0.5954774 | -0.3899633 | 0.6880228 | 0.3315461 | 0.4955936 | 0.7853981 | 1.2165184 |
| | 0.7710664 | 0.3364172 | 0.3688325 | 2.1465368 | 2.4746990 | -0.8448719 | -0.6182352 | | | | | |
| 721 | 0.3999150 | 0.3998148 | 0.7172474 | 0.3036135 | 0.0922252 | -0.5962597 | -0.3904197 | 0.6884849 | 0.3316895 | 0.4955732 | 0.7853981 | 1.2153730 |
| | 0.7693665 | 0.3369855 | 0.3680876 | 2.1466894 | 2.4754391 | -0.8437651 | -0.6169100 | | | | | |
| 722 | 0.3988735 | 0.3988737 | 0.7164382 | 0.3026279 | 0.0919049 | -0.5970415 | -0.3908755 | 0.6889464 | 0.3318286 | 0.4955524 | 0.7853981 | 1.2142305 |
| | 0.7676656 | 0.3375620 | 0.3673418 | 2.1468420 | 2.4761791 | -0.8426557 | -0.6155834 | | | | | |
| 723 | 0.3979327 | 0.3979325 | 0.7156270 | 0.3016421 | 0.0915847 | -0.5978228 | -0.3913311 | 0.6894076 | 0.3319660 | 0.4955322 | 0.7853981 | 1.2130899 |
| | 0.7659627 | 0.3381246 | 0.3665948 | 2.1469965 | 2.4769201 | -0.8415449 | -0.6142567 | | | | | |
| 724 | 0.3969918 | 0.3969908 | 0.7148154 | 0.3006557 | 0.0912645 | -0.5986764 | -0.3917876 | 0.6898709 | 0.3321036 | 0.4955118 | 0.7853981 | 1.2119455 |
| | 0.7642600 | 0.3387091 | 0.3658453 | 2.1471509 | 2.4776630 | -0.8404338 | -0.6129292 | | | | | |
| 725 | 0.3960482 | 0.3960481 | 0.7140017 | 0.2996692 | 0.0909443 | -0.5993869 | -0.3922422 | 0.6903312 | 0.3322397 | 0.4954914 | 0.7853981 | 1.2107997 |
| | 0.7625548 | 0.3352839 | 0.3650944 | 2.1473064 | 2.4784079 | -0.8393213 | -0.6116005 | | | | | |
| 726 | 0.3951051 | 0.3951049 | 0.7131890 | 0.2986820 | 0.0906240 | -0.6001669 | -0.3926961 | 0.6907909 | 0.3323774 | 0.4954712 | 0.7853981 | 1.2096767 |
| | 0.7608475 | 0.3399610 | 0.3643404 | 2.1474628 | 2.4791565 | -0.8382099 | -0.6102719 | | | | | |
| 727 | 0.3941616 | 0.3941616 | 0.7123742 | 0.2976947 | 0.0903038 | -0.6009464 | -0.3931498 | 0.6912503 | 0.3325131 | 0.4954508 | 0.7853981 | 1.2085457 |
| | 0.7591410 | 0.3404384 | 0.3635854 | 2.1476202 | 2.4799061 | -0.8370970 | -0.6089413 | | | | | |
| 728 | 0.3932180 | 0.3932178 | 0.7115596 | 0.2967066 | 0.0899836 | -0.6017250 | -0.3936024 | 0.6917086 | 0.3326495 | 0.4954307 | 0.7853981 | 1.2074184 |
| | 0.7574328 | 0.3410179 | 0.3628272 | 2.1477785 | 2.4806585 | -0.8359846 | -0.6076110 | | | | | |
| 729 | 0.3922738 | 0.3922733 | 0.7107438 | 0.2957184 | 0.0896634 | -0.6025042 | -0.3940557 | 0.6921676 | 0.3327854 | 0.4954106 | 0.7853981 | 1.2062912 |
| | 0.7557230 | 0.3415983 | 0.3620673 | 2.1479378 | 2.4814119 | -0.8348714 | -0.6062797 | | | | | |
| 730 | 0.3913285 | 0.3913283 | 0.7099286 | 0.2947254 | 0.0893431 | -0.6032796 | -0.3945067 | 0.6926227 | 0.3329223 | 0.4953905 | 0.7853981 | 1.2051744 |
| | 0.7540121 | 0.3421808 | 0.3613046 | 2.1480980 | 2.4821701 | -0.8337590 | -0.6049478 | | | | | |
| 731 | 0.3903836 | 0.3903834 | 0.7091109 | 0.2937407 | 0.0891229 | -0.6040573 | -0.3949578 | 0.6930802 | 0.3330567 | 0.4953704 | 0.7853981 | 1.2040529 |
| | 0.7523012 | 0.3427633 | 0.3605409 | 2.1482582 | 2.4829283 | -0.8326448 | -0.6036160 | | | | | |
| 732 | 0.3894370 | 0.3894368 | 0.7083918 | 0.2927514 | 0.0887027 | -0.6048321 | -0.3954076 | 0.6935348 | 0.3331913 | 0.4953503 | 0.7853981 | 1.2029400 |
| | 0.7505868 | 0.3433468 | 0.3597751 | 2.1484213 | 2.4836893 | -0.8315296 | -0.6022817 | | | | | |
| 733 | 0.3884904 | 0.3884903 | 0.7074698 | 0.2917618 | 0.0883825 | -0.6056385 | -0.3958580 | 0.6939909 | 0.3333229 | 0.4953303 | 0.7853981 | 1.2018242 |
| | 0.7488726 | 0.3439306 | 0.3590082 | 2.1485844 | 2.4844503 | -0.8304120 | -0.6009477 | | | | | |
| 734 | 0.3875436 | 0.3875428 | 0.7066491 | 0.2907715 | 0.0880622 | -0.6063823 | -0.3963069 | 0.6944445 | 0.3334567 | 0.4953101 | 0.7853981 | 1.2007160 |
| | 0.7471563 | 0.3445169 | 0.3582379 | 2.1487484 | 2.4852161 | -0.8292960 | -0.5996123 | | | | | |
| 735 | 0.3865950 | 0.3865948 | 0.7058253 | 0.2897813 | 0.0877420 | -0.6071551 | -0.3967547 | 0.6948972 | 0.3335877 | 0.4952901 | 0.7853981 | 1.1996117 |
| | 0.7454390 | 0.3451029 | 0.3574669 | 2.1489134 | 2.4859819 | -0.8281775 | -0.5982763 | | | | | |
| 736 | 0.3856466 | 0.3856466 | 0.7050021 | 0.2887904 | 0.0874218 | -0.6079307 | -0.3972043 | 0.6953525 | 0.3337198 | 0.4952704 | 0.7853981 | 1.1985016 |
| | 0.7437205 | 0.3456912 | 0.3566928 | 2.1490753 | 2.4867506 | -0.8270589 | -0.5969399 | | | | | |
| 737 | 0.3846982 | 0.3846980 | 0.7041790 | 0.2877992 | 0.0871016 | -0.6087129 | -0.3976516 | 0.6958045 | 0.3338513 | 0.4952502 | 0.7853981 | 1.1974010 |
| | 0.7420016 | 0.3462805 | 0.3559167 | 2.1492462 | 2.4875221 | -0.8259419 | -0.5956031 | | | | | |
| 738 | 0.3837488 | 0.3837483 | 0.7033504 | 0.2868077 | 0.0867813 | -0.6094771 | -0.3980998 | 0.6962584 | 0.3339802 | 0.4952306 | 0.7853981 | 1.1962967 |
| | 0.7402802 | 0.3468699 | 0.3551395 | 2.1494141 | 2.4882936 | -0.8248208 | -0.5942646 | | | | | |
| 739 | 0.3827989 | 0.3827985 | 0.7025232 | 0.2858158 | 0.0864611 | -0.6102459 | -0.3985445 | 0.6967070 | 0.3341098 | 0.4952108 | 0.7853981 | 1.1952066 |
| | 0.7385577 | 0.3474609 | 0.3543597 | 2.1495838 | 2.4890690 | -0.8237007 | -0.5929260 | | | | | |
| 740 | 0.3818482 | 0.3818480 | 0.7016960 | 0.2848233 | 0.0861429 | -0.6110192 | -0.3989919 | 0.6971601 | 0.3342400 | 0.4951907 | 0.7853981 | 1.1941071 |
| | 0.7368352 | 0.3480540 | 0.3535770 | 2.1497526 | 2.4898462 | -0.8225807 | -0.5915864 | | | | | |
| 741 | 0.3808975 | 0.3808973 | 0.7008685 | 0.2838308 | 0.0858207 | -0.6117894 | -0.3994371 | 0.6976101 | 0.3343701 | 0.4951710 | 0.7853981 | 1.1930161 |
| | 0.7351113 | 0.3486481 | 0.3527923 | 2.1499233 | 2.4906263 | -0.8214610 | -0.5902467 | | | | | |
| 742 | 0.3799459 | 0.3799453 | 0.7000372 | 0.2828375 | 0.0855004 | -0.6125593 | -0.3998823 | 0.6980597 | 0.3344975 | 0.4951513 | 0.7853981 | 1.1919270 |
| | 0.7333850 | 0.3492425 | 0.3520062 | 2.1500950 | 2.4914074 | -0.8203380 | -0.5889052 | | | | | |
| 743 | 0.3789932 | 0.3789930 | 0.6992056 | 0.2818442 | 0.0851802 | -0.6133295 | -0.4003262 | 0.6985087 | 0.3346249 | 0.4951315 | 0.7853981 | 1.1908407 |
| | 0.7316574 | 0.3498380 | 0.3512181 | 2.1502686 | 2.4921913 | -0.8192151 | -0.5875632 | | | | | |
| 744 | 0.3780401 | 0.3780399 | 0.6983742 | 0.2808509 | 0.0848600 | -0.6140950 | -0.4007687 | 0.6989551 | 0.3347533 | 0.4951122 | 0.7853981 | 1.1897621 |
| | 0.7299282 | 0.3504358 | 0.3504266 | 2.1504421 | 2.4929790 | -0.8180926 | -0.5862201 | | | | | |
| 745 | 0.3770875 | 0.3770873 | 0.6975421 | 0.2798576 | 0.0845398 | -0.6148640 | -0.4012127 | 0.6994038 | 0.3348806 | 0.4950924 | 0.7853981 | 1.1886787 |
| | 0.7281998 | 0.3510245 | 0.3496334 | 2.1506176 | 2.4937668 | -0.8169711 | -0.5848778 | | | | | |
| 746 | 0.3761331 | 0.3761330 | 0.6967059 | 0.2788643 | 0.0842195 | -0.6156291 | -0.4016537 | 0.6998496 | 0.3350054 | 0.4950727 | 0.7853981 | 1.1876059 |
| | 0.7264680 | 0.3516130 | 0.3488331 | 2.1507943 | 2.4945574 | -0.8158441 | -0.5835329 | | | | | |
| 747 | 0.3751791 | 0.3751789 | 0.6958701 | 0.2778665 | 0.0838993 | -0.6164081 | -0.4020994 | 0.7002975 | 0.3351630 | 0.4950523 | 0.7853981 | 1.1870785 |
| | 0.7246478 | 0.3522232 | 0.3480423 | 2.1509730 | 2.4953414 | -0.8147187 | -0.5821195 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 748 | 0.3742220 | 0.3742219 | 0.6950318 | 0.2768710 | 0.0835791 | -0.6171567 | -0.4025342 | 0.7037357 | 0.3352551 | 0.4950336 | 0.7853981 | 1.1854696 |
| | 0.7229997 | 0.3528340 | 0.3472435 | 2.1511488 | 2.4961462 | 0.8135915 | 0.5808401 | | | | | |
| 749 | 0.3732190 | 0.3732188 | 0.6941934 | 0.2758753 | 0.0832589 | -0.6176965 | -0.4028397 | 0.7009554 | 0.3354106 | 0.4950132 | 0.7853981 | 1.1849413 |
| | 0.7211784 | 0.3534266 | 0.3464422 | 2.1513376 | 2.4970341 | 0.8124645 | 0.5794266 | | | | | |
| 750 | 0.3722621 | 0.3722619 | 0.6933550 | 0.2748790 | 0.0829386 | -0.6184583 | -0.4032704 | 0.7013969 | 0.3355355 | 0.4949939 | 0.7853981 | 1.1838808 |
| | 0.7194405 | 0.3540307 | 0.3456382 | 2.1515179 | 2.4978352 | 0.8113379 | 0.5780783 | | | | | |
| 751 | 0.3713056 | 0.3713055 | 0.6925158 | 0.2738824 | 0.0826184 | -0.6192222 | -0.4037102 | 0.7018406 | 0.3356553 | 0.4949745 | 0.7853981 | 1.1828156 |
| | 0.7177042 | 0.3546343 | 0.3449318 | 2.1516991 | 2.4986372 | 0.8102110 | 0.5767309 | | | | | |
| 752 | 0.3703479 | 0.3703477 | 0.6916751 | 0.2728853 | 0.0822982 | -0.6199823 | -0.4041552 | 0.7022805 | 0.3357828 | 0.4949551 | 0.7853981 | 1.1817608 |
| | 0.7159646 | 0.3552429 | 0.3442231 | 2.1518822 | 2.4994431 | 0.8090830 | 0.5753814 | | | | | |
| 753 | 0.3693904 | 0.3693902 | 0.6908336 | 0.2718880 | 0.0819780 | -0.6207446 | -0.4045915 | 0.7027225 | 0.3359053 | 0.4949358 | 0.7853981 | 1.1807022 |
| | 0.7142255 | 0.3558558 | 0.3432124 | 2.1520653 | 2.5002499 | 0.8079547 | 0.5740322 | | | | | |
| 754 | 0.3684323 | 0.3684319 | 0.6899905 | 0.2708901 | 0.0816577 | -0.6215091 | -0.4050329 | 0.7031668 | 0.3360274 | 0.4949164 | 0.7853981 | 1.1796358 |
| | 0.7124946 | 0.3564599 | 0.3423991 | 2.1522503 | 2.5010586 | 0.8068256 | 0.5726821 | | | | | |
| 755 | 0.3674726 | 0.3674724 | 0.6891469 | 0.2698919 | 0.0813375 | -0.6222683 | -0.4054691 | 0.7036058 | 0.3361451 | 0.4948974 | 0.7853981 | 1.1785698 |
| | 0.7107408 | 0.3570658 | 0.3415839 | 2.1524383 | 2.5018711 | 0.8056952 | 0.5713302 | | | | | |
| 756 | 0.3665131 | 0.3665129 | 0.6883019 | 0.2688931 | 0.0810173 | -0.6230295 | -0.4059062 | 0.7040467 | 0.3362701 | 0.4948781 | 0.7853981 | 1.1775370 |
| | 0.7089568 | 0.3576816 | 0.3407659 | 2.1526261 | 2.5026855 | 0.8045652 | 0.5699783 | | | | | |
| 757 | 0.3655537 | 0.3655536 | 0.6874573 | 0.2678940 | 0.0806971 | -0.6237897 | -0.4063424 | 0.7044867 | 0.3363914 | 0.4948590 | 0.7853981 | 1.1764879 |
| | 0.7072532 | 0.3582948 | 0.3399454 | 2.1528120 | 2.5035019 | 0.8034355 | 0.5686268 | | | | | |
| 758 | 0.3645926 | 0.3645924 | 0.6866110 | 0.2668945 | 0.0803768 | -0.6245478 | -0.4067774 | 0.7049246 | 0.3365125 | 0.4948396 | 0.7853981 | 1.1754436 |
| | 0.7055066 | 0.3589092 | 0.3391225 | 2.1530008 | 2.5043221 | 0.8023047 | 0.5672727 | | | | | |
| 759 | 0.3636314 | 0.3636312 | 0.6857634 | 0.2658947 | 0.0800564 | -0.6253052 | -0.4072117 | 0.7053618 | 0.3366324 | 0.4948207 | 0.7853981 | 1.1744032 |
| | 0.7037585 | 0.3595245 | 0.3382976 | 2.1531916 | 2.5051441 | 0.8011730 | 0.5659186 | | | | | |
| 760 | 0.3626695 | 0.3626697 | 0.6849148 | 0.2648942 | 0.0797364 | -0.6260679 | -0.4076485 | 0.7058033 | 0.3367517 | 0.4948016 | 0.7853981 | 1.1733532 |
| | 0.7020105 | 0.3601415 | 0.3374700 | 2.1533833 | 2.5059471 | 0.8000407 | 0.5645643 | | | | | |
| 761 | 0.3617073 | 0.3617071 | 0.6840650 | 0.2638937 | 0.0794162 | -0.6268184 | -0.4080787 | 0.7062345 | 0.3368708 | 0.4947827 | 0.7853981 | 1.1723289 |
| | 0.7002600 | 0.3607550 | 0.3366405 | 2.1535759 | 2.5067449 | 0.7989079 | 0.5632079 | | | | | |
| 762 | 0.3607442 | 0.3607441 | 0.6832116 | 0.2628927 | 0.0790959 | -0.6275790 | -0.4085144 | 0.7066749 | 0.3369867 | 0.4947636 | 0.7853981 | 1.1712837 |
| | 0.6985082 | 0.3613771 | 0.3358095 | 2.1537704 | 2.5076218 | 0.7977720 | 0.5618513 | | | | | |
| 763 | 0.3597802 | 0.3597800 | 0.6823585 | 0.2618913 | 0.0787757 | -0.6283293 | -0.4089435 | 0.7071050 | 0.3371027 | 0.4947446 | 0.7853981 | 1.1702642 |
| | 0.6967545 | 0.3619967 | 0.3349756 | 2.1539661 | 2.5084543 | 0.7966368 | 0.5604932 | | | | | |
| 764 | 0.3588157 | 0.3588155 | 0.6815041 | 0.2608895 | 0.0784554 | -0.6290872 | -0.4093773 | 0.7075427 | 0.3372159 | 0.4947256 | 0.7853981 | 1.1692276 |
| | 0.6950302 | 0.3626176 | 0.3341393 | 2.1541615 | 2.5092969 | 0.7955018 | 0.5591345 | | | | | |
| 765 | 0.3578516 | 0.3578508 | 0.6806480 | 0.2598873 | 0.0781353 | -0.6298411 | -0.4098082 | 0.7079763 | 0.3373347 | 0.4947070 | 0.7853981 | 1.1682014 |
| | 0.6932445 | 0.3632353 | 0.3333010 | 2.1543589 | 2.5101223 | 0.7943638 | 0.5577756 | | | | | |
| 766 | 0.3568854 | 0.3568854 | 0.6797930 | 0.2588845 | 0.0778150 | -0.6305959 | -0.4102399 | 0.7084109 | 0.3374513 | 0.4946880 | 0.7853981 | 1.1671743 |
| | 0.6914390 | 0.3638636 | 0.3324509 | 2.1545582 | 2.5109615 | 0.7932280 | 0.5564157 | | | | | |
| 767 | 0.3559156 | 0.3559106 | 0.6789364 | 0.2578813 | 0.0774948 | -0.6313487 | -0.4106696 | 0.7088435 | 0.3375666 | 0.4946690 | 0.7853981 | 1.1661530 |
| | 0.6897303 | 0.3644880 | 0.3316148 | 2.1547585 | 2.5118027 | 0.7920912 | 0.5550553 | | | | | |
| 768 | 0.3549533 | 0.3549533 | 0.6780795 | 0.2568777 | 0.0771745 | -0.6321024 | -0.4111001 | 0.7092765 | 0.3376821 | 0.4946503 | 0.7853981 | 1.1651316 |
| | 0.6879714 | 0.3651158 | 0.3307678 | 2.1549597 | 2.5126467 | 0.7909545 | 0.5536942 | | | | | |
| 769 | 0.3539858 | 0.3539858 | 0.6772191 | 0.2558737 | 0.0768543 | -0.6328553 | -0.4115300 | 0.7097096 | 0.3377952 | 0.4946316 | 0.7853981 | 1.1641121 |
| | 0.6862101 | 0.3657429 | 0.3299192 | 2.1551619 | 2.5134926 | 0.7898149 | 0.5523314 | | | | | |
| 770 | 0.3530181 | 0.3530179 | 0.6763574 | 0.2548695 | 0.0765341 | -0.6336121 | -0.4119557 | 0.7101382 | 0.3379073 | 0.4946131 | 0.7853981 | 1.1631069 |
| | 0.6844472 | 0.3663708 | 0.3290687 | 2.1553659 | 2.5143423 | 0.7886747 | 0.5509682 | | | | | |
| 771 | 0.3520457 | 0.3520457 | 0.6754978 | 0.2538646 | 0.0762138 | -0.6343518 | -0.4123931 | 0.7105656 | 0.3380219 | 0.4945944 | 0.7853981 | 1.1620970 |
| | 0.6826841 | 0.3670018 | 0.3282138 | 2.1555719 | 2.5151949 | 0.7875368 | 0.5496045 | | | | | |
| 772 | 0.3510813 | 0.3510811 | 0.6746356 | 0.2528596 | 0.0758936 | -0.6351027 | -0.4128113 | 0.7109883 | 0.3381343 | 0.4945757 | 0.7853981 | 1.1610851 |
| | 0.6809201 | 0.3676331 | 0.3273575 | 2.1557779 | 2.5160484 | 0.7863970 | 0.5482402 | | | | | |
| 773 | 0.3501112 | 0.3501110 | 0.6737696 | 0.2518543 | 0.0755734 | -0.6358538 | -0.4132289 | 0.7114272 | 0.3382442 | 0.4945571 | 0.7853981 | 1.1600742 |
| | 0.6791531 | 0.3682646 | 0.3264995 | 2.1559859 | 2.5169039 | 0.7852538 | 0.5468739 | | | | | |
| 774 | 0.3491411 | 0.3491409 | 0.6729034 | 0.2508481 | 0.0752532 | -0.6366042 | -0.4136464 | 0.7118574 | 0.3383541 | 0.4945384 | 0.7853981 | 1.1590652 |
| | 0.6773855 | 0.3688977 | 0.3256387 | 2.1561956 | 2.5177622 | 0.7841111 | 0.5455076 | | | | | |
| 775 | 0.3481656 | 0.3481656 | 0.6720377 | 0.2498416 | 0.0749329 | -0.6373473 | -0.4140891 | 0.7122892 | 0.3384653 | 0.4945202 | 0.7853981 | 1.1580753 |
| | 0.6756154 | 0.3695331 | 0.3247745 | 2.1564064 | 2.5186272 | 0.7829692 | 0.5441357 | | | | | |
| 776 | 0.3471903 | 0.3471901 | 0.6711696 | 0.2488350 | 0.0746127 | -0.6380969 | -0.4145157 | 0.7127257 | 0.3385743 | 0.4945015 | 0.7853981 | 1.1570702 |
| | 0.6738451 | 0.3701686 | 0.3239086 | 2.1566172 | 2.5194893 | 0.7818255 | 0.5427715 | | | | | |
| 777 | 0.3462264 | 0.3462262 | 0.6702994 | 0.2478275 | 0.0742925 | -0.6388485 | -0.4149432 | 0.7131610 | 0.3386821 | 0.4944833 | 0.7853981 | 1.1560621 |
| | 0.6720746 | 0.3708056 | 0.3230400 | 2.1568308 | 2.5203543 | 0.7806802 | 0.5414021 | | | | | |
| 778 | 0.3452542 | 0.3452541 | 0.6694322 | 0.2468199 | 0.0739723 | -0.6395971 | -0.4153656 | 0.7135943 | 0.3387928 | 0.4944646 | 0.7853981 | 1.1550732 |
| | 0.6703026 | 0.3714455 | 0.3221675 | 2.1570444 | 2.5212250 | 0.7795383 | 0.5400338 | | | | | |
| 779 | 0.3442816 | 0.3442808 | 0.6685603 | 0.2458118 | 0.0736521 | -0.6403374 | -0.4157884 | 0.7139894 | 0.3388959 | 0.4944463 | 0.7853981 | 1.1540813 |
| | 0.6685278 | 0.3720851 | 0.3212936 | 2.1572609 | 2.5220976 | 0.7783924 | 0.5386631 | | | | | |
| 780 | 0.3433071 | 0.3433071 | 0.6676883 | 0.2448032 | 0.0733318 | -0.6410836 | -0.4162129 | 0.7144154 | 0.3389973 | 0.4944281 | 0.7853981 | 1.1530886 |
| | 0.6667528 | 0.3727266 | 0.3204166 | 2.1574783 | 2.5229721 | 0.7772468 | 0.5372921 | | | | | |
| 781 | 0.3423327 | 0.3423325 | 0.6668155 | 0.2437943 | 0.0730116 | -0.6418256 | -0.4166337 | 0.7148372 | 0.3391148 | 0.4944098 | 0.7853981 | 1.1520963 |
| | 0.6649754 | 0.3733693 | 0.3195379 | 2.1576967 | 2.5239514 | 0.7761009 | 0.5359195 | | | | | |
| 782 | 0.3413573 | 0.3413571 | 0.6659390 | 0.2427851 | 0.0726914 | -0.6425703 | -0.4170563 | 0.7152616 | 0.3392292 | 0.4943914 | 0.7853981 | 1.1511192 |
| | 0.6631963 | 0.3740129 | 0.3186559 | 2.1579170 | 2.5247337 | 0.7749521 | 0.5345463 | | | | | |
| 783 | 0.3403819 | 0.3403813 | 0.6650627 | 0.2417753 | 0.0723711 | -0.6433141 | -0.4174779 | 0.7156852 | 0.3393243 | 0.4943731 | 0.7853981 | 1.1501350 |
| | 0.6614176 | 0.3746568 | 0.3177715 | 2.1581373 | 2.5256129 | 0.7738038 | 0.5331723 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 785 | 0.6596341 | 0.3753024 | 0.3168847 | 2.1583614 | 2.5264997 | 0.7726540 | 0.5317964 | 0.7169251 | 0.3395340 | 0.4943370 | 0.7853981 | 1.1481771 |
| | 0.3384284 | 0.3384282 | 0.6633081 | 0.2397542 | 0.0717307 | -0.6447985 | -0.4183190 | | | | | |
| | 0.6578537 | 0.3759513 | 0.3159935 | 2.1585846 | 2.5273876 | 0.7715068 | 0.5304219 | | | | | |
| 786 | 0.3374508 | 0.3374506 | 0.6624296 | 0.2387433 | 0.0714105 | -0.6455361 | -0.4187365 | 0.7169466 | 0.3396364 | 0.4943191 | 0.7853981 | 1.1472092 |
| | 0.6560690 | 0.3766004 | 0.3151006 | 2.1588116 | 2.5282812 | 0.7703579 | 0.5290453 | | | | | |
| 787 | 0.3364728 | 0.3364726 | 0.6615495 | 0.2377315 | 0.0710902 | -0.6462906 | -0.4191579 | 0.7173708 | 0.3397419 | 0.4943007 | 0.7853981 | 1.1462269 |
| | 0.6542851 | 0.3772511 | 0.3142046 | 2.1590376 | 2.5291739 | 0.7692080 | 0.5276685 | | | | | |
| 788 | 0.3354945 | 0.3354943 | 0.6606688 | 0.2367196 | 0.0707700 | -0.6470177 | -0.4195747 | 0.7177877 | 0.3398457 | 0.4942828 | 0.7853981 | 1.1452627 |
| | 0.6524986 | 0.3779031 | 0.3133060 | 2.1592674 | 2.5300722 | 0.7680579 | 0.5262909 | | | | | |
| 789 | 0.3345150 | 0.3345148 | 0.6597876 | 0.2357069 | 0.0704490 | -0.6477570 | -0.4199929 | 0.7182068 | 0.3399488 | 0.4942649 | 0.7853981 | 1.1442947 |
| | 0.6507106 | 0.3785571 | 0.3124039 | 2.1594973 | 2.5309734 | 0.7669079 | 0.5249118 | | | | | |
| 790 | 0.3335356 | 0.3335354 | 0.6589048 | 0.2346543 | 0.0701296 | -0.6484997 | -0.4204125 | 0.7186293 | 0.3400509 | 0.4942470 | 0.7853981 | 1.1433191 |
| | 0.6489230 | 0.3792115 | 0.3114099 | 2.1597281 | 2.5318747 | 0.7657568 | 0.5235331 | | | | | |
| 791 | 0.3325564 | 0.3325545 | 0.6580198 | 0.2336078 | 0.0698093 | -0.6492331 | -0.4208266 | 0.7190424 | 0.3401522 | 0.4942290 | 0.7853981 | 1.1423664 |
| | 0.6471316 | 0.3798674 | 0.3105929 | 2.1599617 | 2.5327826 | 0.7646042 | 0.5221519 | | | | | |
| 792 | 0.3315740 | 0.3315739 | 0.6571370 | 0.2326669 | 0.0694891 | -0.6499760 | -0.4212463 | 0.7194651 | 0.3402554 | 0.4942111 | 0.7853981 | 1.1413937 |
| | 0.6453415 | 0.3805261 | 0.3096818 | 2.1601954 | 2.5336914 | 0.7634543 | 0.5207714 | | | | | |
| 793 | 0.3305927 | 0.3305925 | 0.6562503 | 0.2316526 | 0.0691689 | -0.6507135 | -0.4216627 | 0.7198824 | 0.3403556 | 0.4941936 | 0.7853981 | 1.1404324 |
| | 0.6435481 | 0.3811843 | 0.3087690 | 2.1604328 | 2.5346031 | 0.7623007 | 0.5193909 | | | | | |
| 794 | 0.3296102 | 0.3296100 | 0.6553637 | 0.2306381 | 0.0688487 | -0.6514452 | -0.4220752 | 0.7202939 | 0.3404566 | 0.4941756 | 0.7853981 | 1.1394863 |
| | 0.6417536 | 0.3818451 | 0.3078532 | 2.1606773 | 2.5355196 | 0.7611480 | 0.5180067 | | | | | |
| 795 | 0.3286269 | 0.3286268 | 0.6544722 | 0.2296233 | 0.0685284 | -0.6521838 | -0.4224916 | 0.7207122 | 0.3405536 | 0.4941577 | 0.7853981 | 1.1385250 |
| | 0.6399576 | 0.3825053 | 0.3069357 | 2.1609257 | 2.5364351 | 0.7599912 | 0.5166227 | | | | | |
| 796 | 0.3276436 | 0.3276434 | 0.6535826 | 0.2286077 | 0.0682082 | -0.6529175 | -0.4229051 | 0.7211257 | 0.3406528 | 0.4941491 | 0.7853981 | 1.1375761 |
| | 0.6381605 | 0.3831660 | 0.3061144 | 2.1611595 | 2.5373564 | 0.7589368 | 0.5152383 | | | | | |
| 797 | 0.3266595 | 0.3266594 | 0.6526923 | 0.2275914 | 0.0678880 | -0.6536527 | -0.4233191 | 0.7215407 | 0.3407518 | 0.4941226 | 0.7853981 | 1.1366243 |
| | 0.6363618 | 0.3838228 | 0.3052895 | 2.1613941 | 2.5382805 | 0.7576820 | 0.5138531 | | | | | |
| 798 | 0.3256743 | 0.3256741 | 0.6517083 | 0.2265753 | 0.0675678 | -0.6543881 | -0.4237333 | 0.7219558 | 0.3408481 | 0.4941046 | 0.7853981 | 1.1356735 |
| | 0.6345620 | 0.3844970 | 0.3041633 | 2.1616373 | 2.5392056 | 0.7565243 | 0.5124663 | | | | | |
| 799 | 0.3246884 | 0.3246882 | 0.6509253 | 0.2255582 | 0.0672475 | -0.6551183 | -0.4241443 | 0.7223659 | 0.3409460 | 0.4940875 | 0.7853981 | 1.1347351 |
| | 0.6327592 | 0.3851443 | 0.3032327 | 2.1618834 | 2.5401373 | 0.7553680 | 0.5110785 | | | | | |
| 800 | 0.3237029 | 0.3237029 | 0.6500116 | 0.2245409 | 0.0669273 | -0.6558539 | -0.4245577 | 0.7227812 | 0.3410429 | 0.4940698 | 0.7853981 | 1.1337852 |
| | 0.6309582 | 0.3858328 | 0.3022993 | 2.1621314 | 2.5410691 | 0.7542117 | 0.5096917 | | | | | |
| 801 | 0.3227156 | 0.3227156 | 0.6491148 | 0.2235229 | 0.0666071 | -0.6565834 | -0.4249679 | 0.7231904 | 0.3411385 | 0.4940523 | 0.7853981 | 1.1328506 |
| | 0.6291531 | 0.3865021 | 0.3013632 | 2.1623802 | 2.5420055 | 0.7530528 | 0.5083022 | | | | | |
| 802 | 0.3217282 | 0.3217282 | 0.6482185 | 0.2225049 | 0.0662879 | -0.6573166 | -0.4253803 | 0.7236035 | 0.3412346 | 0.4940347 | 0.7853981 | 1.1319084 |
| | 0.6273475 | 0.3871731 | 0.3004241 | 2.1626291 | 2.5429440 | 0.7518950 | 0.5069123 | | | | | |
| 803 | 0.3207408 | 0.3207408 | 0.6473220 | 0.2214869 | 0.0659686 | -0.6580498 | -0.4257921 | 0.7240164 | 0.3413307 | 0.4940172 | 0.7853981 | 1.1309662 |
| | 0.6255420 | 0.3878462 | 0.2994812 | 2.1628828 | 2.5438862 | 0.7507375 | 0.5055225 | | | | | |
| 804 | 0.3197530 | 0.3197529 | 0.6464260 | 0.2204667 | 0.0656464 | -0.6587774 | -0.4262003 | 0.7244238 | 0.3414279 | 0.4939999 | 0.7853981 | 1.1300383 |
| | 0.6237351 | 0.3885215 | 0.2985345 | 2.1631365 | 2.5448332 | 0.7495810 | 0.5041322 | | | | | |
| 805 | 0.3187645 | 0.3187647 | 0.6455316 | 0.2194466 | 0.0653262 | -0.6595370 | -0.4266096 | 0.7248331 | 0.3415267 | 0.4939826 | 0.7853981 | 1.1291065 |
| | 0.6219270 | 0.3891959 | 0.2975833 | 2.1633930 | 2.5457850 | 0.7484265 | 0.5027416 | | | | | |
| 806 | 0.3177752 | 0.3177752 | 0.6446307 | 0.2184245 | 0.0650059 | -0.6602394 | -0.4270209 | 0.7252454 | 0.3416204 | 0.4939651 | 0.7853981 | 1.1281691 |
| | 0.6201165 | 0.3898766 | 0.2966317 | 2.1636515 | 2.5467358 | 0.7472665 | 0.5013489 | | | | | |
| 807 | 0.3167856 | 0.3167849 | 0.6437313 | 0.2174058 | 0.0646857 | -0.6609478 | -0.4274293 | 0.7256535 | 0.3417163 | 0.4939479 | 0.7853981 | 1.1272421 |
| | 0.6183151 | 0.3905560 | 0.2956758 | 2.1639090 | 2.5476913 | 0.7461083 | 0.4999552 | | | | | |
| 808 | 0.3157946 | 0.3157945 | 0.6428299 | 0.2163846 | 0.0643655 | -0.6616959 | -0.4278379 | 0.7260614 | 0.3418103 | 0.4939307 | 0.7853981 | 1.1263161 |
| | 0.6164930 | 0.3912364 | 0.2947170 | 2.1641693 | 2.5485498 | 0.7449488 | 0.4985616 | | | | | |
| 809 | 0.3148034 | 0.3148031 | 0.6419285 | 0.2153629 | 0.0640453 | -0.6624247 | -0.4282465 | 0.7264699 | 0.3419052 | 0.4939135 | 0.7853981 | 1.1253901 |
| | 0.6146782 | 0.3919161 | 0.2937545 | 2.1644335 | 2.5496130 | 0.7437899 | 0.4971664 | | | | | |
| 810 | 0.3138115 | 0.3138113 | 0.6410236 | 0.2143410 | 0.0637251 | -0.6631514 | -0.4286520 | 0.7268764 | 0.3419972 | 0.4938962 | 0.7853981 | 1.1244688 |
| | 0.6128632 | 0.3926017 | 0.2927903 | 2.1646967 | 2.5505772 | 0.7426282 | 0.4957708 | | | | | |
| 811 | 0.3128181 | 0.3128179 | 0.6401156 | 0.2133185 | 0.0634048 | -0.6638767 | -0.4290580 | 0.7272815 | 0.3420873 | 0.4938754 | 0.7853981 | 1.1235523 |
| | 0.6110436 | 0.3932849 | 0.2918234 | 2.1649647 | 2.5515451 | 0.7414641 | 0.4943731 | | | | | |
| 812 | 0.3118245 | 0.3118247 | 0.6392090 | 0.2122957 | 0.0630846 | -0.6646013 | -0.4294634 | 0.7276859 | 0.3421788 | 0.4938622 | 0.7853981 | 1.1226377 |
| | 0.6092256 | 0.3939704 | 0.2908526 | 2.1652327 | 2.5525163 | 0.7403019 | 0.4929755 | | | | | |
| 813 | 0.3107961 | 0.3107959 | 0.6382995 | 0.2112727 | 0.0627643 | -0.6651630 | -0.4297725 | 0.7279264 | 0.3422914 | 0.4938447 | 0.7853981 | 1.1220942 |
| | 0.6073417 | 0.3946469 | 0.2898788 | 2.1655121 | 2.5535593 | 0.7391374 | 0.4915781 | | | | | |
| 814 | 0.3098006 | 0.3098004 | 0.6373906 | 0.2102484 | 0.0624442 | -0.6658790 | -0.4301739 | 0.7283231 | 0.3423825 | 0.4938278 | 0.7853981 | 1.1211987 |
| | 0.6055185 | 0.3953356 | 0.2889015 | 2.1657839 | 2.5545307 | 0.7379741 | 0.4901277 | | | | | |
| 815 | 0.3088053 | 0.3088051 | 0.6364832 | 0.2092241 | 0.0621235 | -0.6665871 | -0.4305801 | 0.7287310 | 0.3424721 | 0.4938106 | 0.7853981 | 1.1202784 |
| | 0.6036966 | 0.3960248 | 0.2879209 | 2.1660576 | 2.5555201 | 0.7368100 | 0.4887269 | | | | | |
| 816 | 0.3078094 | 0.3078092 | 0.6355708 | 0.2081992 | 0.0618037 | -0.6673254 | -0.4309809 | 0.7291251 | 0.3425633 | 0.4937937 | 0.7853981 | 1.1193810 |
| | 0.6018714 | 0.3967169 | 0.2869360 | 2.1663342 | 2.5565071 | 0.7356473 | 0.4873258 | | | | | |
| 817 | 0.3068129 | 0.3068127 | 0.6346592 | 0.2071738 | 0.0614834 | -0.6680500 | -0.4313853 | 0.7295334 | 0.3426530 | 0.4937769 | 0.7853981 | 1.1184702 |
| | 0.6000457 | 0.3974101 | 0.2859483 | 2.1665117 | 2.5574951 | 0.7344832 | 0.4859238 | | | | | |
| 818 | 0.3058156 | 0.3058155 | 0.6337457 | 0.2061481 | 0.0611632 | -0.6687717 | -0.4317877 | 0.7299349 | 0.3427414 | 0.4937600 | 0.7853981 | 1.1175471 |
| | 0.5982187 | 0.3981041 | 0.2849578 | 2.1668911 | 2.5584869 | 0.7333178 | 0.4845209 | | | | | |
| 819 | 0.3048177 | 0.3048176 | 0.6328327 | 0.2051216 | 0.0608431 | -0.6694911 | -0.4321887 | 0.7303340 | 0.3428300 | 0.4937431 | 0.7853981 | 1.1166697 |
| | 0.5963901 | 0.3988007 | 0.2839628 | 2.1671724 | 2.5594815 | 0.7321534 | 0.4831175 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 820 | 0.3038198 | 0.3038197 | 0.6319195 | 0.2040948 | 0.0605228 | -0.6702150 | -0.4325925 | 0.7307378 | 0.3429204 | 0.4937266 | 0.7853981 | 1.1157627 |
| | 0.5945611 | 0.3994588 | 0.2829645 | 2.1674557 | 2.5604820 | 0.7399895 | 0.4817132 | | | | | |
| 821 | 0.3028211 | 0.3028209 | 0.6319923 | 0.2034675 | 0.0602025 | -0.6709358 | -0.4329949 | 0.7311383 | 0.3430066 | 0.4937098 | 0.7853981 | 1.1148643 |
| | 0.5927305 | 0.4001973 | 0.2819638 | 2.1677418 | 2.5614834 | 0.7298223 | 0.4803083 | | | | | |
| 822 | 0.3018210 | 0.3018208 | 0.6300851 | 0.2020398 | 0.0590823 | -0.6716531 | -0.4333931 | 0.7315354 | 0.3430541 | 0.4936529 | 0.7853981 | 1.1139746 |
| | 0.5908975 | 0.4008576 | 0.2809592 | 2.1680289 | 2.5624895 | 0.7286557 | 0.4789015 | | | | | |
| 823 | 0.3008207 | 0.3008205 | 0.6291678 | 0.2011114 | 0.0595621 | -0.6723738 | -0.4337944 | 0.7319359 | 0.3431417 | 0.4936764 | 0.7853981 | 1.1130772 |
| | 0.5898632 | 0.4016100 | 0.2799507 | 2.1683187 | 2.5634995 | 0.7274997 | 0.4774944 | | | | | |
| 824 | 0.2998196 | 0.2998195 | 0.6282462 | 0.2001830 | 0.0592419 | -0.6730901 | -0.4341924 | 0.7323320 | 0.3432657 | 0.4936599 | 0.7853981 | 1.1121902 |
| | 0.5888275 | 0.4023020 | 0.2789404 | 2.1686096 | 2.5645113 | 0.7263201 | 0.4760863 | | | | | |
| 825 | 0.2988173 | 0.2988172 | 0.6273229 | 0.1989535 | 0.0589216 | -0.6738196 | -0.4345926 | 0.7327312 | 0.3433881 | 0.4936433 | 0.7853981 | 1.1112976 |
| | 0.5877895 | 0.4030048 | 0.2779271 | 2.1688943 | 2.5655260 | 0.7251487 | 0.4746765 | | | | | |
| 826 | 0.2978151 | 0.2978149 | 0.6263998 | 0.1979243 | 0.0586014 | -0.6745285 | -0.4349923 | 0.7331300 | 0.3434326 | 0.4936269 | 0.7853981 | 1.1104069 |
| | 0.5867514 | 0.4037106 | 0.2769091 | 2.1691599 | 2.5665445 | 0.7239757 | 0.4732669 | | | | | |
| 827 | 0.2968116 | 0.2968116 | 0.6254754 | 0.1969542 | 0.0582812 | -0.6752441 | -0.4353855 | 0.7335253 | 0.3435159 | 0.4936104 | 0.7853981 | 1.1095247 |
| | 0.5857110 | 0.4044174 | 0.2758877 | 2.1694584 | 2.5675678 | 0.7228093 | 0.4718559 | | | | | |
| 828 | 0.2958078 | 0.2958077 | 0.6245502 | 0.1958636 | 0.0579610 | -0.6759595 | -0.4357867 | 0.7339205 | 0.3435950 | 0.4935939 | 0.7853981 | 1.1086435 |
| | 0.5846656 | 0.4051256 | 0.2748629 | 2.1697979 | 2.5685749 | 0.7216388 | 0.4704443 | | | | | |
| 829 | 0.2948037 | 0.2948035 | 0.6236243 | 0.1948325 | 0.0576407 | -0.6766746 | -0.4361834 | 0.7343153 | 0.3436817 | 0.4935774 | 0.7853981 | 1.1077633 |
| | 0.5836272 | 0.4058356 | 0.2738343 | 2.1701002 | 2.5696249 | 0.7204681 | 0.4690319 | | | | | |
| 830 | 0.2937984 | 0.2937983 | 0.6226955 | 0.1938011 | 0.0573205 | -0.6773891 | -0.4365796 | 0.7347096 | 0.3437628 | 0.4935612 | 0.7853981 | 1.1068859 |
| | 0.5825822 | 0.4065463 | 0.2728028 | 2.1704054 | 2.5706597 | 0.7192957 | 0.4676181 | | | | | |
| 831 | 0.2927918 | 0.2927917 | 0.6217657 | 0.1927690 | 0.0570003 | -0.6781011 | -0.4369742 | 0.7351013 | 0.3438435 | 0.4935447 | 0.7853981 | 1.1060152 |
| | 0.5743351 | 0.4072582 | 0.2717677 | 2.1707125 | 2.5716963 | 0.7181223 | 0.4662026 | | | | | |
| 832 | 0.2917855 | 0.2917857 | 0.6209361 | 0.1917365 | 0.0566801 | -0.6788196 | -0.4373725 | 0.7354957 | 0.3439242 | 0.4935286 | 0.7853981 | 1.1051292 |
| | 0.5724850 | 0.4079723 | 0.2707286 | 2.1710205 | 2.5727353 | 0.7169519 | 0.4647807 | | | | | |
| 833 | 0.2907791 | 0.2907789 | 0.6199075 | 0.1907032 | 0.0563598 | -0.6795337 | -0.4377683 | 0.7358935 | 0.3440067 | 0.4935124 | 0.7853981 | 1.1042547 |
| | 0.5706407 | 0.4086954 | 0.2696844 | 2.1713314 | 2.5737820 | 0.7157793 | 0.4633722 | | | | | |
| 834 | 0.2897714 | 0.2897710 | 0.6189745 | 0.1896698 | 0.0560396 | -0.6802443 | -0.4381615 | 0.7362839 | 0.3440862 | 0.4934963 | 0.7853981 | 1.1033888 |
| | 0.5687904 | 0.4094157 | 0.2686384 | 2.1716452 | 2.5749310 | 0.7146055 | 0.4619551 | | | | | |
| 835 | 0.2887625 | 0.2887623 | 0.6180392 | 0.1886358 | 0.0557194 | -0.6809564 | -0.4385552 | 0.7366757 | 0.3441623 | 0.4934801 | 0.7853981 | 1.1025209 |
| | 0.5669385 | 0.4101231 | 0.2675891 | 2.1719608 | 2.5758820 | 0.7134293 | 0.4605368 | | | | | |
| 836 | 0.2877536 | 0.2877535 | 0.6171064 | 0.1876014 | 0.0553992 | -0.6816686 | -0.4389492 | 0.7370678 | 0.3442435 | 0.4934640 | 0.7853981 | 1.1016521 |
| | 0.5650861 | 0.4108435 | 0.2665347 | 2.1722784 | 2.5769386 | 0.7122566 | 0.4591184 | | | | | |
| 837 | 0.2867435 | 0.2867433 | 0.6161702 | 0.1865662 | 0.0550789 | -0.6823784 | -0.4393416 | 0.7374573 | 0.3443215 | 0.4934478 | 0.7853981 | 1.1007900 |
| | 0.5632310 | 0.4115646 | 0.2654771 | 2.1725988 | 2.5779991 | 0.7110812 | 0.4576981 | | | | | |
| 838 | 0.2857331 | 0.2857329 | 0.6152338 | 0.1855308 | 0.0547587 | -0.6830903 | -0.4397352 | 0.7378490 | 0.3443995 | 0.4934317 | 0.7853981 | 1.0999241 |
| | 0.5613755 | 0.4122874 | 0.2644157 | 2.1729212 | 2.5790625 | 0.7099061 | 0.4562776 | | | | | |
| 839 | 0.2847222 | 0.2847221 | 0.6142976 | 0.1844946 | 0.0544385 | -0.6837962 | -0.4401246 | 0.7382346 | 0.3444785 | 0.4934159 | 0.7853981 | 1.0990725 |
| | 0.5595182 | 0.4130124 | 0.2633496 | 2.1732473 | 2.5801315 | 0.7087323 | 0.4548565 | | | | | |
| 840 | 0.2837111 | 0.2837110 | 0.6133578 | 0.1834582 | 0.0541183 | -0.6845000 | -0.4405182 | 0.7386273 | 0.3445541 | 0.4934000 | 0.7853981 | 1.0982056 |
| | 0.5576606 | 0.4137377 | 0.2622812 | 2.1735744 | 2.5812016 | 0.7075555 | 0.4534352 | | | | | |
| 841 | 0.2826982 | 0.2826980 | 0.6124160 | 0.1824212 | 0.0537980 | -0.6852135 | -0.4409194 | 0.7390175 | 0.3446292 | 0.4933839 | 0.7853981 | 1.0973454 |
| | 0.5558001 | 0.4144638 | 0.2612091 | 2.1739035 | 2.5822754 | 0.7063774 | 0.4520112 | | | | | |
| 842 | 0.2816846 | 0.2816845 | 0.6114740 | 0.1813838 | 0.0534778 | -0.6859226 | -0.4413981 | 0.7394004 | 0.3447044 | 0.4933681 | 0.7853981 | 1.0965023 |
| | 0.5539371 | 0.4151918 | 0.2601329 | 2.1742373 | 2.5833559 | 0.7051998 | 0.4505865 | | | | | |
| 843 | 0.2806709 | 0.2806703 | 0.6105297 | 0.1803458 | 0.0531576 | -0.6866146 | -0.4416907 | 0.7397922 | 0.3447784 | 0.4933524 | 0.7853981 | 1.0956392 |
| | 0.5520731 | 0.4159208 | 0.2590531 | 2.1745710 | 2.5844374 | 0.7040207 | 0.4491617 | | | | | |
| 844 | 0.2796558 | 0.2796557 | 0.6095825 | 0.1793076 | 0.0528374 | -0.6873434 | -0.4420812 | 0.7401807 | 0.3448496 | 0.4933366 | 0.7853981 | 1.0947847 |
| | 0.5502085 | 0.4166501 | 0.2579706 | 2.1749086 | 2.5855217 | 0.7028396 | 0.4477349 | | | | | |
| 845 | 0.2786400 | 0.2786399 | 0.6086351 | 0.1782683 | 0.0525171 | -0.6880651 | -0.4424675 | 0.7405623 | 0.3449239 | 0.4933208 | 0.7853981 | 1.0939465 |
| | 0.5483415 | 0.4173827 | 0.2568821 | 2.1752491 | 2.5865146 | 0.7016608 | 0.4463071 | | | | | |
| 846 | 0.2776258 | 0.2776248 | 0.6076923 | 0.1772290 | 0.0521969 | -0.6887553 | -0.4428585 | 0.7409523 | 0.3449982 | 0.4933049 | 0.7853981 | 1.0930901 |
| | 0.5464755 | 0.4181173 | 0.2557897 | 2.1755905 | 2.5877085 | 0.7004834 | 0.4448805 | | | | | |
| 847 | 0.2766075 | 0.2766078 | 0.6067441 | 0.1761897 | 0.0518767 | -0.6894563 | -0.4432443 | 0.7413339 | 0.3450707 | 0.4932895 | 0.7853981 | 1.0922546 |
| | 0.5446055 | 0.4188526 | 0.2546936 | 2.1759347 | 2.5888000 | 0.6993032 | -0.4436512 | | | | | |
| 848 | 0.2755907 | 0.2755905 | 0.6057944 | 0.1751494 | 0.0515565 | -0.6901635 | -0.4436328 | 0.7417200 | 0.3451421 | 0.4932736 | 0.7853981 | 1.0914068 |
| | 0.5427356 | 0.4195866 | 0.2535943 | 2.1762829 | 2.5899135 | 0.6981225 | -0.4440215 | | | | | |
| 849 | 0.2745724 | 0.2745723 | 0.6048439 | 0.1741071 | 0.0512362 | -0.6908658 | -0.4440187 | 0.7421020 | 0.3452137 | 0.4932583 | 0.7853981 | 1.0905695 |
| | 0.5408627 | 0.4203267 | 0.2524902 | 2.1766338 | 2.5911177 | 0.6969416 | -0.4444206 | | | | | |
| 850 | 0.2735543 | 0.2735541 | 0.6038931 | 0.1730658 | 0.0509160 | -0.6915703 | -0.4444159 | 0.7424864 | 0.3452848 | 0.4932428 | 0.7853981 | 1.0897284 |
| | 0.5389898 | 0.4210662 | 0.2513823 | 2.1769876 | 2.5921288 | 0.6957612 | -0.4448198 | | | | | |
| 851 | 0.2725346 | 0.2725344 | 0.6029398 | 0.1720236 | 0.0505958 | -0.6922717 | -0.4444603 | 0.7428675 | 0.3453549 | 0.4932274 | 0.7853981 | 1.0888948 |
| | 0.5371146 | 0.4218068 | 0.2502734 | 2.1773424 | 2.5932446 | 0.6945791 | -0.4452270 | | | | | |
| 852 | 0.2715151 | 0.2715150 | 0.6019885 | 0.1709813 | 0.0502756 | -0.6929736 | -0.4451763 | 0.7432491 | 0.3454268 | 0.4932119 | 0.7853981 | 1.0880613 |
| | 0.5352384 | 0.4225501 | 0.2491534 | 2.1777020 | 2.5943651 | 0.6933905 | -0.4362045 | | | | | |
| 853 | 0.2704942 | 0.2704942 | 0.6010332 | 0.1699378 | 0.0499553 | -0.6936786 | -0.4455633 | 0.7436339 | 0.3454960 | 0.4931964 | 0.7853981 | 1.0872211 |
| | 0.5333606 | 0.4232937 | 0.2480332 | 2.1780624 | 2.5954876 | 0.6921973 | -0.4366603 | | | | | |
| 854 | 0.2694725 | 0.2694724 | 0.6001761 | 0.1688942 | 0.0496351 | -0.6943769 | -0.4459459 | 0.7440121 | 0.3455643 | 0.4931810 | 0.7853981 | 1.0863562 |
| | 0.5314806 | 0.4240392 | 0.2469093 | 2.1784267 | 2.5966158 | 0.6910034 | -0.4370747 | | | | | |
| 855 | 0.2684502 | 0.2684502 | 0.5991178 | 0.1678511 | 0.0493143 | -0.6950794 | -0.4463313 | 0.7443942 | 0.3456317 | 0.4931655 | 0.7853981 | 1.0855637 |
| | 0.5295998 | 0.4247841 | 0.2457811 | 2.1787930 | 2.5977468 | 0.6898094 | -0.4374884 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 857 | 0.2664044 | 0.2664040 | 0.5971983 | 0.1657603 | 0.0486744 | -0.6964831 | -0.4470999 | 0.7451575 | 0.3457657 | 0.4931354 | 0.7853981 | 1.0839024 |
| | 0.5258332 | 0.4262605 | 0.2435120 | 2.1795359 | 2.6000223 | 0.6874809 | 0.4291147 | | | | | |
| 858 | 0.2653757 | 0.2653757 | 0.5962371 | 0.1647146 | 0.0483542 | -0.6971796 | -0.4474810 | 0.7455338 | 0.3458322 | 0.4931195 | 0.7853981 | 1.0830841 |
| | 0.5239481 | 0.4270308 | 0.2423711 | 2.1799107 | 2.6011677 | 0.6862964 | 0.4276751 | | | | | |
| 859 | 0.2643546 | 0.2643545 | 0.5952751 | 0.1636682 | 0.0480340 | -0.6978778 | -0.4478627 | 0.7455117 | 0.3458989 | 0.4931049 | 0.7853981 | 1.0822639 |
| | 0.5220606 | 0.4277630 | 0.2412253 | 2.1802893 | 2.6023169 | 0.6851118 | 0.4262351 | | | | | |
| 860 | 0.2633251 | 0.2633250 | 0.5943118 | 0.1626216 | 0.0477138 | -0.6985732 | -0.4482427 | 0.7462869 | 0.3459646 | 0.4930897 | 0.7853981 | 1.0814486 |
| | 0.5201718 | 0.4285361 | 0.2400758 | 2.1806717 | 2.6034718 | 0.6939268 | 0.4247945 | | | | | |
| 861 | 0.2623129 | 0.2623128 | 0.5933448 | 0.1615742 | 0.0473935 | -0.6992761 | -0.4486273 | 0.7466656 | 0.3460213 | 0.4930747 | 0.7853981 | 1.0806189 |
| | 0.5182823 | 0.4292897 | 0.2389226 | 2.1810560 | 2.6046267 | 0.6927390 | 0.4233533 | | | | | |
| 862 | 0.2612759 | 0.2612758 | 0.5923812 | 0.1605265 | 0.0471733 | -0.6999713 | -0.4490111 | 0.7470446 | 0.3460541 | 0.4930595 | 0.7853981 | 1.0798063 |
| | 0.5163907 | 0.4300464 | 0.2377634 | 2.1814432 | 2.6057911 | 0.6915553 | 0.4219108 | | | | | |
| 863 | 0.2602231 | 0.2602230 | 0.5914131 | 0.1594780 | 0.0467530 | -0.7006431 | -0.4493159 | 0.7472562 | 0.3461738 | 0.4930444 | 0.7853981 | 1.0792618 |
| | 0.5144515 | 0.4307934 | 0.2366005 | 2.1818428 | 2.6070395 | 0.6903679 | 0.4204323 | | | | | |
| 864 | 0.2592192 | 0.2592191 | 0.5904452 | 0.1584292 | 0.0466329 | -0.7013595 | -0.4497648 | 0.7477928 | 0.3462213 | 0.4930300 | 0.7853981 | 1.0781870 |
| | 0.5126024 | 0.4315616 | 0.2354338 | 2.1822271 | 2.6081295 | 0.6891815 | 0.4190224 | | | | | |
| 865 | 0.2581646 | 0.2581647 | 0.5894743 | 0.1573157 | 0.0461126 | -0.7019371 | -0.4500739 | 0.7480447 | 0.3462998 | 0.4930146 | 0.7853981 | 1.0776424 |
| | 0.5106595 | 0.4323111 | 0.2342626 | 2.1826344 | 2.6093578 | 0.6879932 | 0.4175418 | | | | | |
| 866 | 0.2571342 | 0.2571342 | 0.5885012 | 0.1563300 | 0.0457924 | -0.7026250 | -0.4504514 | 0.7484174 | 0.3463603 | 0.4929999 | 0.7853981 | 1.0768375 |
| | 0.5087614 | 0.4330707 | 0.2330977 | 2.1830339 | 2.6105375 | 0.6868034 | 0.4160947 | | | | | |
| 867 | 0.2561032 | 0.2561032 | 0.5875283 | 0.1552794 | 0.0454721 | -0.7032180 | -0.4508289 | 0.7487501 | 0.3464215 | 0.4929848 | 0.7853981 | 1.0760326 |
| | 0.5068616 | 0.4338328 | 0.2319074 | 2.1834393 | 2.6117229 | 0.6856147 | 0.4146471 | | | | | |
| 868 | 0.2550721 | 0.2550719 | 0.5865538 | 0.1542286 | 0.0451519 | -0.7040109 | -0.4512064 | 0.7491629 | 0.3464816 | 0.4929703 | 0.7853981 | 1.0752287 |
| | 0.5049608 | 0.4345958 | 0.2307230 | 2.1838446 | 2.6129122 | 0.6844252 | 0.4131991 | | | | | |
| 869 | 0.2540395 | 0.2540398 | 0.5855781 | 0.1531769 | 0.0448317 | -0.7047033 | -0.4515833 | 0.7495350 | 0.3465413 | 0.4929556 | 0.7853981 | 1.0744267 |
| | 0.5030585 | 0.4353604 | 0.2295337 | 2.1842546 | 2.6141062 | 0.6832354 | 0.4117507 | | | | | |
| 870 | 0.2530066 | 0.2530067 | 0.5846008 | 0.1521249 | 0.0445115 | -0.7053955 | -0.4519603 | 0.7499370 | 0.3466001 | 0.4929408 | 0.7853981 | 1.0736256 |
| | 0.5011545 | 0.4361256 | 0.2283404 | 2.1846676 | 2.6153043 | 0.6820448 | 0.4102997 | | | | | |
| 871 | 0.2519732 | 0.2519732 | 0.5836244 | 0.1510722 | 0.0441912 | -0.7060899 | -0.4523380 | 0.7502811 | 0.3466604 | 0.4929262 | 0.7853981 | 1.0728207 |
| | 0.4992493 | 0.4368535 | 0.2271413 | 2.1850843 | 2.6165075 | 0.6808558 | 0.4088488 | | | | | |
| 872 | 0.2509391 | 0.2509390 | 0.5826451 | 0.1500192 | 0.0438710 | -0.7067809 | -0.4527135 | 0.7506519 | 0.3467183 | 0.4929118 | 0.7853981 | 1.0720234 |
| | 0.4973422 | 0.4376616 | 0.2259386 | 2.1855049 | 2.6177149 | 0.6796650 | 0.4073969 | | | | | |
| 873 | 0.2499045 | 0.2499043 | 0.5816678 | 0.1489652 | 0.0435508 | -0.7074722 | -0.4530894 | 0.7510230 | 0.3467789 | 0.4928970 | 0.7853981 | 1.0712261 |
| | 0.4954346 | 0.4384327 | 0.2247295 | 2.1859283 | 2.6189289 | 0.6784771 | 0.4059446 | | | | | |
| 874 | 0.2488681 | 0.2488680 | 0.5806840 | 0.1479112 | 0.0432306 | -0.7081602 | -0.4534631 | 0.7513908 | 0.3468342 | 0.4928826 | 0.7853981 | 1.0704365 |
| | 0.4935238 | 0.4392022 | 0.2235182 | 2.1863546 | 2.6201458 | 0.6772835 | 0.4044899 | | | | | |
| 875 | 0.2478316 | 0.2478317 | 0.5797023 | 0.1468562 | 0.0429103 | -0.7088504 | -0.4538377 | 0.7517608 | 0.3468919 | 0.4928682 | 0.7853981 | 1.0696430 |
| | 0.4916124 | 0.4399750 | 0.2223005 | 2.1867857 | 2.6213684 | 0.6760929 | 0.4030355 | | | | | |
| 876 | 0.2467946 | 0.2467946 | 0.5787198 | 0.1458009 | 0.0425901 | -0.7095385 | -0.4542113 | 0.7521287 | 0.3469495 | 0.4928539 | 0.7853981 | 1.0688543 |
| | 0.4896956 | 0.4407488 | 0.2210781 | 2.1872196 | 2.6225958 | 0.6749124 | 0.4015800 | | | | | |
| 877 | 0.2457566 | 0.2457565 | 0.5777324 | 0.1447451 | 0.0422699 | -0.7102293 | -0.4545856 | 0.7524992 | 0.3470032 | 0.4928395 | 0.7853981 | 1.0680609 |
| | 0.4877847 | 0.4415225 | 0.2198522 | 2.1876574 | 2.6238261 | 0.6737080 | 0.4001231 | | | | | |
| 878 | 0.2447180 | 0.2447178 | 0.5767469 | 0.1436887 | 0.0419497 | -0.7109141 | -0.4549569 | 0.7528638 | 0.3470552 | 0.4928251 | 0.7853981 | 1.0672808 |
| | 0.4858686 | 0.4422984 | 0.2186295 | 2.1881089 | 2.6250639 | 0.6725164 | 0.3986655 | | | | | |
| 879 | 0.2436786 | 0.2436785 | 0.5757589 | 0.1426216 | 0.0416294 | -0.7116050 | -0.4553213 | 0.7532344 | 0.3471134 | 0.4928107 | 0.7853981 | 1.0664883 |
| | 0.4839505 | 0.4430753 | 0.2173942 | 2.1885443 | 2.6263046 | 0.6713231 | 0.3972070 | | | | | |
| 880 | 0.2426385 | 0.2426384 | 0.5747713 | 0.1415741 | 0.0413092 | -0.7122890 | -0.4556914 | 0.7535982 | 0.3471687 | 0.4927966 | 0.7853981 | 1.0657110 |
| | 0.4820316 | 0.4438538 | 0.2161425 | 2.1889935 | 2.6275539 | 0.6701313 | 0.3957477 | | | | | |
| 881 | 0.2415976 | 0.2415975 | 0.5737817 | 0.1405159 | 0.0409892 | -0.7129768 | -0.4560741 | 0.7539657 | 0.3472229 | 0.4927822 | 0.7853981 | 1.0649261 |
| | 0.4801111 | 0.4446334 | 0.2148960 | 2.1894455 | 2.6288042 | 0.6689382 | 0.3942871 | | | | | |
| 882 | 0.2405560 | 0.2405559 | 0.5727903 | 0.1394573 | 0.0406688 | -0.7136601 | -0.4564439 | 0.7543288 | 0.3472759 | 0.4927682 | 0.7853981 | 1.0641518 |
| | 0.4781886 | 0.4454135 | 0.2136459 | 2.1899023 | 2.6300611 | 0.6677443 | 0.3928259 | | | | | |
| 882 | 0.2395138 | 0.2395137 | 0.5717978 | 0.1383980 | 0.0403485 | -0.7143472 | -0.4568155 | 0.7546957 | 0.3473284 | 0.4927541 | 0.7853981 | 1.0633698 |
| | 0.4762648 | 0.4461952 | 0.2123885 | 2.1903629 | 2.6313229 | 0.6665504 | 0.3913637 | | | | | |
| 884 | 0.2384711 | 0.2384710 | 0.5708056 | 0.1373382 | 0.0400283 | -0.7150322 | -0.4571861 | 0.7550606 | 0.3473817 | 0.4927402 | 0.7853981 | 1.0625925 |
| | 0.4743395 | 0.4469786 | 0.2111272 | 2.1908274 | 2.6325903 | 0.6653576 | 0.3899013 | | | | | |
| 885 | 0.2374275 | 0.2374274 | 0.5698112 | 0.1362778 | 0.0397081 | -0.7157132 | -0.4575565 | 0.7554262 | 0.3474336 | 0.4927260 | 0.7853981 | 1.0618143 |
| | 0.4724133 | 0.4477627 | 0.2098607 | 2.1912956 | 2.6338615 | 0.6641636 | 0.3884371 | | | | | |
| 886 | 0.2363830 | 0.2363829 | 0.5688148 | 0.1352170 | 0.0393879 | -0.7164063 | -0.4579252 | 0.7557882 | 0.3474844 | 0.4927120 | 0.7853981 | 1.0610447 |
| | 0.4704851 | 0.4485472 | 0.2085897 | 2.1917677 | 2.6351305 | 0.6629686 | 0.3869721 | | | | | |
| 887 | 0.2353374 | 0.2353373 | 0.5678172 | 0.1341555 | 0.0390676 | -0.7170932 | -0.4582935 | 0.7561508 | 0.3475348 | 0.4926983 | 0.7853981 | 1.0602741 |
| | 0.4685541 | 0.4493331 | 0.2073133 | 2.1922445 | 2.6363212 | 0.6617733 | 0.3855056 | | | | | |
| 888 | 0.2342914 | 0.2342913 | 0.5668176 | 0.1330935 | 0.0387474 | -0.7177640 | -0.4586628 | 0.7565114 | 0.3475841 | 0.4926846 | 0.7853981 | 1.0595083 |
| | 0.4666219 | 0.4501196 | 0.2061322 | 2.1927261 | 2.6377087 | 0.6605771 | 0.3840385 | | | | | |
| 889 | 0.2332444 | 0.2332443 | 0.5659158 | 0.1320316 | 0.0384272 | -0.7184492 | -0.4590305 | 0.7568763 | 0.3476318 | 0.4926706 | 0.7853981 | 1.0587329 |
| | 0.4646886 | 0.4509069 | 0.2047461 | 2.1932106 | 2.6389999 | 0.6593796 | 0.3825703 | | | | | |
| 890 | 0.2321965 | 0.2321967 | 0.5648130 | 0.1309690 | 0.0381070 | -0.7191314 | -0.4593983 | 0.7572384 | 0.3476790 | 0.4926568 | 0.7853981 | 1.0579672 |
| | 0.4627536 | 0.4516950 | 0.2034549 | 2.1936998 | 2.6402969 | 0.6581822 | 0.3811014 | | | | | |
| 891 | 0.2311462 | 0.2311461 | 0.5638094 | 0.1299042 | 0.0377867 | -0.7198114 | -0.4597647 | 0.7575981 | 0.3477265 | 0.4926431 | 0.7853981 | 1.0572042 |
| | 0.4608166 | 0.4524845 | 0.2021581 | 2.1941935 | 2.6415957 | 0.6569849 | 0.3796309 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 892 | 0.2300988 | 0.2300587 | 0.5628032 | 0.1288401 | 0.0374665 | -0.7204908 | -0.4601306 | 0.7579573 | 0.3477721 | 0.4926295 | 0.7853981 | 1.0564442 |
| | 0.4588775 | 0.4532742 | 0.2008567 | 2.1966917 | 2.6429081 | 0.6457860 | 0.3781595 | | | | | |
| 893 | 0.2290496 | 0.2290469 | 0.5617974 | 0.1277751 | 0.0371463 | -0.7211716 | -0.4604968 | 0.7583178 | 0.3478187 | 0.4926158 | 0.7853981 | 1.0556822 |
| | 0.4569378 | 0.4540660 | 0.1995491 | 2.1951942 | 2.6442213 | 0.6445895 | 0.3766878 | | | | | |
| 894 | 0.2279987 | 0.2279986 | 0.5607924 | 0.1267008 | 0.0368261 | -0.7218509 | -0.4608626 | 0.7586770 | 0.3478663 | 0.4926021 | 0.7853981 | 1.0549221 |
| | 0.4549076 | 0.4548592 | 0.1982357 | 2.1936597 | 2.6455412 | 0.6433928 | 0.3752154 | | | | | |
| 895 | 0.2269475 | 0.2269474 | 0.5597879 | 0.1256436 | 0.0365058 | -0.7225269 | -0.4612263 | 0.7590327 | 0.3479153 | 0.4925887 | 0.7853981 | 1.0541716 |
| | 0.4530546 | 0.4556542 | 0.1969160 | 2.1921109 | 2.6468687 | 0.6421986 | 0.3737418 | | | | | |
| 896 | 0.2258966 | 0.2258959 | 0.5587779 | 0.1245771 | 0.0361856 | -0.7232098 | -0.4615934 | 0.7593954 | 0.3479594 | 0.4925750 | 0.7853981 | 1.0534058 |
| | 0.4511113 | 0.4564484 | 0.1955928 | 2.1907268 | 2.6481972 | 0.6410000 | 0.3722678 | | | | | |
| 897 | 0.2248430 | 0.2248428 | 0.5577670 | 0.1235099 | 0.0358654 | -0.7238945 | -0.4619555 | 0.7597498 | 0.3480039 | 0.4925617 | 0.7853981 | 1.0526591 |
| | 0.4491648 | 0.4572435 | 0.1942636 | 2.1892475 | 2.6495333 | 0.6398016 | 0.3707919 | | | | | |
| 898 | 0.2237855 | 0.2237851 | 0.5567555 | 0.1224420 | 0.0355451 | -0.7245618 | -0.4623192 | 0.7601069 | 0.3480484 | 0.4925483 | 0.7853981 | 1.0519056 |
| | 0.4472168 | 0.4580359 | 0.1929286 | 2.1877330 | 2.6508751 | 0.6386034 | 0.3693151 | | | | | |
| 899 | 0.2227356 | 0.2227355 | 0.5557443 | 0.1213738 | 0.0352249 | -0.7252411 | -0.4626841 | 0.7604660 | 0.3480933 | 0.4925347 | 0.7853981 | 1.0511494 |
| | 0.4452693 | 0.4588376 | 0.1915879 | 2.1863023 | 2.6522217 | 0.6374069 | 0.3678386 | | | | | |
| 900 | 0.2216865 | 0.2216864 | 0.5547332 | 0.1203047 | 0.0349047 | -0.7259153 | -0.4630456 | 0.7608199 | 0.3481392 | 0.4925216 | 0.7853981 | 1.0504045 |
| | 0.4433188 | 0.4596367 | 0.1902410 | 2.1848373 | 2.6535759 | 0.6362112 | 0.3663607 | | | | | |
| 901 | 0.2206245 | 0.2206247 | 0.5537164 | 0.1192354 | 0.0345845 | -0.7265916 | -0.4634084 | 0.7611760 | 0.3481806 | 0.4925083 | 0.7853981 | 1.0496559 |
| | 0.4413661 | 0.4604346 | 0.1888902 | 2.1833771 | 2.6549339 | 0.6350111 | 0.3648809 | | | | | |
| 902 | 0.2195682 | 0.2195681 | 0.5526981 | 0.1181653 | 0.0342642 | -0.7272673 | -0.4637735 | 0.7615315 | 0.3482212 | 0.4924950 | 0.7853981 | 1.0489092 |
| | 0.4394121 | 0.4612333 | 0.1875336 | 2.1819216 | 2.6562947 | 0.6338106 | 0.3634004 | | | | | |
| 903 | 0.2184917 | 0.2184916 | 0.5516787 | 0.1170948 | 0.0339440 | -0.7279440 | -0.4640797 | 0.7618930 | 0.3482741 | 0.4924816 | 0.7853981 | 1.0483599 |
| | 0.4374213 | 0.4620225 | 0.1861714 | 2.1804805 | 2.6577072 | 0.6326101 | 0.3618922 | | | | | |
| 904 | 0.2174340 | 0.2174339 | 0.5506626 | 0.1160234 | 0.0336238 | -0.7286225 | -0.4644406 | 0.7621463 | 0.3483179 | 0.4924686 | 0.7853981 | 1.0476189 |
| | 0.4354647 | 0.4628246 | 0.1848017 | 2.1790355 | 2.6590843 | 0.6314138 | 0.3604105 | | | | | |
| 905 | 0.2163745 | 0.2163748 | 0.5496617 | 0.1149517 | 0.0333036 | -0.7291948 | -0.4648004 | 0.7624984 | 0.3483580 | 0.4924552 | 0.7853981 | 1.0468807 |
| | 0.4335063 | 0.4636253 | 0.1834279 | 2.1775944 | 2.6604652 | 0.6302140 | 0.3589271 | | | | | |
| 906 | 0.2153156 | 0.2153155 | 0.5486218 | 0.1138791 | 0.0329833 | -0.7298668 | -0.4651597 | 0.7628501 | 0.3483995 | 0.4924423 | 0.7853981 | 1.0461435 |
| | 0.4315462 | 0.4644261 | 0.1820471 | 2.1761595 | 2.6618538 | 0.6290162 | 0.3574433 | | | | | |
| 907 | 0.2142552 | 0.2142550 | 0.5475972 | 0.1128063 | 0.0326631 | -0.7305414 | -0.4655208 | 0.7632045 | 0.3484375 | 0.4924293 | 0.7853981 | 1.0454016 |
| | 0.4295842 | 0.4652259 | 0.1806619 | 2.1747302 | 2.6632462 | 0.6278148 | 0.3559581 | | | | | |
| 908 | 0.2131940 | 0.2131938 | 0.5465734 | 0.1117326 | 0.0323429 | -0.7312130 | -0.4658798 | 0.7635559 | 0.3484769 | 0.4924163 | 0.7853981 | 1.0446672 |
| | 0.4276206 | 0.4660332 | 0.1792699 | 2.1733062 | 2.6646452 | 0.6266154 | 0.3544727 | | | | | |
| 909 | 0.2121315 | 0.2121318 | 0.5455472 | 0.1106585 | 0.0320227 | -0.7318847 | -0.4662389 | 0.7639073 | 0.3485149 | 0.4924036 | 0.7853981 | 1.0439320 |
| | 0.4256545 | 0.4668363 | 0.1778726 | 2.1718876 | 2.6660509 | 0.6254148 | 0.3529848 | | | | | |
| 910 | 0.2110694 | 0.2110693 | 0.5445214 | 0.1095836 | 0.0317024 | -0.7325573 | -0.4665979 | 0.7642597 | 0.3485525 | 0.4923906 | 0.7853981 | 1.0431957 |
| | 0.4236850 | 0.4676429 | 0.1764686 | 2.1704735 | 2.6674614 | 0.6242155 | 0.3514971 | | | | | |
| 911 | 0.2100068 | 0.2100062 | 0.5434940 | 0.1085093 | 0.0313822 | -0.7332280 | -0.4669561 | 0.7646102 | 0.3485911 | 0.4923779 | 0.7853981 | 1.0424643 |
| | 0.4217212 | 0.4684446 | 0.1750590 | 2.1689657 | 2.6688786 | 0.6230159 | 0.3500087 | | | | | |
| 912 | 0.2089422 | 0.2089421 | 0.5424648 | 0.1074323 | 0.0310619 | -0.7338962 | -0.4673126 | 0.7649581 | 0.3486280 | 0.4923649 | 0.7853981 | 1.0417385 |
| | 0.4197513 | 0.4692507 | 0.1736432 | 2.1674646 | 2.6703024 | 0.6218157 | 0.3485150 | | | | | |
| 913 | 0.2078772 | 0.2078770 | 0.5414343 | 0.1063558 | 0.0307418 | -0.7345654 | -0.4676692 | 0.7653071 | 0.3486645 | 0.4923522 | 0.7853981 | 1.0410109 |
| | 0.4177800 | 0.4700559 | 0.1722217 | 2.1659674 | 2.6717319 | 0.6206153 | 0.3470281 | | | | | |
| 914 | 0.2068111 | 0.2068110 | 0.5404018 | 0.1052786 | 0.0304215 | -0.7352325 | -0.4680247 | 0.7656540 | 0.3486998 | 0.4923397 | 0.7853981 | 1.0402889 |
| | 0.4158061 | 0.4708612 | 0.1707940 | 2.1644777 | 2.6731682 | 0.6194142 | 0.3455359 | | | | | |
| 915 | 0.2057451 | 0.2057450 | 0.5393699 | 0.1042009 | 0.0301013 | -0.7359043 | -0.4683830 | 0.7660056 | 0.3487357 | 0.4923270 | 0.7853981 | 1.0395565 |
| | 0.4138324 | 0.4716677 | 0.1693597 | 2.1629528 | 2.6746092 | 0.6182147 | 0.3440441 | | | | | |
| 916 | 0.2046772 | 0.2046770 | 0.5383335 | 0.1031235 | 0.0297813 | -0.7365708 | -0.4687377 | 0.7663518 | 0.3487689 | 0.4923147 | 0.7853981 | 1.0388365 |
| | 0.4118547 | 0.4724731 | 0.1679201 | 2.1614146 | 2.6760578 | 0.6170120 | 0.3425496 | | | | | |
| 917 | 0.2036091 | 0.2036090 | 0.5372983 | 0.1020436 | 0.0294608 | -0.7372373 | -0.4690927 | 0.7666982 | 0.3488036 | 0.4923020 | 0.7853981 | 1.0381165 |
| | 0.4098765 | 0.4732755 | 0.1664737 | 2.1598421 | 2.6775122 | 0.6158116 | 0.3410550 | | | | | |
| 918 | 0.2025403 | 0.2025402 | 0.5362610 | 0.1009640 | 0.0291406 | -0.7379047 | -0.4694474 | 0.7670453 | 0.3488369 | 0.4922894 | 0.7853981 | 1.0373955 |
| | 0.4078978 | 0.4740762 | 0.1650210 | 2.1582744 | 2.6789722 | 0.6146106 | 0.3395595 | | | | | |
| 919 | 0.2014703 | 0.2014702 | 0.5352213 | 0.0998839 | 0.0288204 | -0.7385723 | -0.4698024 | 0.7673927 | 0.3488688 | 0.4922771 | 0.7853981 | 1.0366745 |
| | 0.4059157 | 0.4748721 | 0.1635526 | 2.1567153 | 2.6804399 | 0.6134091 | 0.3380636 | | | | | |
| 920 | 0.2003996 | 0.2003995 | 0.5341805 | 0.0988030 | 0.0285001 | -0.7392389 | -0.4701564 | 0.7677381 | 0.3489004 | 0.4922647 | 0.7853981 | 1.0359583 |
| | 0.4039328 | 0.4756685 | 0.1620975 | 2.1551619 | 2.6819124 | 0.6122058 | 0.3365647 | | | | | |
| 921 | 0.1993284 | 0.1993282 | 0.5331398 | 0.0977218 | 0.0281799 | -0.7399045 | -0.4705104 | 0.7680845 | 0.3489314 | 0.4922525 | 0.7853981 | 1.0352402 |
| | 0.4019475 | 0.4764649 | 0.1606261 | 2.1536152 | 2.6833916 | 0.6110039 | 0.3350664 | | | | | |
| 922 | 0.1982564 | 0.1982563 | 0.5320965 | 0.0966396 | 0.0278597 | -0.7405691 | -0.4708633 | 0.7684288 | 0.3489633 | 0.4922402 | 0.7853981 | 1.0345278 |
| | 0.3999614 | 0.4772520 | 0.1591476 | 2.1519741 | 2.6848293 | 0.6098032 | 0.3335671 | | | | | |
| 923 | 0.1971837 | 0.1971836 | 0.5310546 | 0.0955571 | 0.0275395 | -0.7412336 | -0.4712163 | 0.7687731 | 0.3489953 | 0.4922279 | 0.7853981 | 1.0338144 |
| | 0.3979742 | 0.4780350 | 0.1576628 | 2.1503385 | 2.6863718 | 0.6086031 | 0.3320671 | | | | | |
| 924 | 0.1961105 | 0.1961104 | 0.5300109 | 0.0944737 | 0.0272192 | -0.7418974 | -0.4715683 | 0.7691166 | 0.3490263 | 0.4922159 | 0.7853981 | 1.0331039 |
| | 0.3959853 | 0.4788161 | 0.1561712 | 2.1487112 | 2.6878719 | 0.6074029 | 0.3305662 | | | | | |
| 925 | 0.1950362 | 0.1950362 | 0.5289654 | 0.0933888 | 0.0268990 | -0.7425628 | -0.4719211 | 0.7694618 | 0.3490567 | 0.4922036 | 0.7853981 | 1.0323915 |
| | 0.3939948 | 0.4795926 | 0.1546735 | 2.1470922 | 2.6893778 | 0.6062022 | 0.3290643 | | | | | |
| 926 | 0.1939607 | 0.1939607 | 0.5279175 | 0.0923054 | 0.0265788 | -0.7432263 | -0.4722731 | 0.7698051 | 0.3490860 | 0.4921913 | 0.7853981 | 1.0316820 |
| | 0.3920115 | 0.4803689 | 0.1531689 | 2.1454759 | 2.6908903 | 0.6050008 | 0.3275607 | | | | | |
| 927 | 0.1928845 | 0.1928844 | 0.5268678 | 0.0912215 | 0.0262586 | -0.7438844 | -0.4726214 | 0.7701431 | 0.3491136 | 0.4921794 | 0.7853981 | 1.0309849 |
| | 0.3900365 | 0.4811429 | 0.1516584 | 2.1438732 | 2.6924114 | 0.6037982 | 0.3260541 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 928 | 0.1918075 | 0.1918077 | 0.5258177 | 0.0901347 | 0.0259383 | -0.7445695 | -0.4729738 | 0.7704878 | 0.3491418 | 0.4921674 | 0.7853981 | 1.0302734 |
| | 0.3880106 | 0.4821496 | 0.1501405 | 2.2140702 | 2.6939373 | 0.6025968 | 0.3245513 | | | | | |
| 929 | 0.1917374 | 0.1907303 | 0.5247663 | 0.0899484 | 0.0256181 | -0.7452113 | -0.4733241 | 0.7708294 | 0.3491691 | 0.4921554 | 0.7853981 | 1.0295696 |
| | 0.3860132 | 0.4829546 | 0.1486161 | 2.2167778 | 2.6954699 | 0.6013955 | 0.3230454 | | | | | |
| 930 | 0.1896521 | 0.1896520 | 0.5237145 | 0.0879614 | 0.0252979 | -0.7458733 | -0.4736744 | 0.7711712 | 0.3491971 | 0.4921435 | 0.7853981 | 1.0288658 |
| | 0.3840144 | 0.4837596 | 0.1472844 | 2.2174921 | 2.6970100 | 0.6001951 | 0.3215386 | | | | | |
| 931 | 0.1885725 | 0.1885720 | 0.5226607 | 0.0868739 | 0.0249777 | -0.7465304 | -0.4740218 | 0.7715081 | 0.3492239 | 0.4921318 | 0.7853981 | 1.0281725 |
| | 0.3820125 | 0.4845636 | 0.1455463 | 2.2182150 | 2.6985588 | 0.5989939 | 0.3200306 | | | | | |
| 932 | 0.1874930 | 0.1874928 | 0.5216060 | 0.0857856 | 0.0246574 | -0.7471938 | -0.4743725 | 0.7718512 | 0.3492503 | 0.4921198 | 0.7853981 | 1.0274668 |
| | 0.3800105 | 0.4853674 | 0.1440009 | 2.2189445 | 2.7001123 | 0.5977932 | 0.3185218 | | | | | |
| 933 | 0.1864128 | 0.1864124 | 0.5205489 | 0.0846969 | 0.0243372 | -0.7478551 | -0.4747222 | 0.7721923 | 0.3492752 | 0.4921082 | 0.7853981 | 1.0267658 |
| | 0.3780068 | 0.4861701 | 0.1424491 | 2.2196817 | 2.7016726 | 0.5965917 | 0.3170126 | | | | | |
| 934 | 0.1853161 | 0.1853160 | 0.5194893 | 0.0836074 | 0.0240173 | -0.7484382 | -0.4750680 | 0.7724552 | 0.3492984 | 0.4920962 | 0.7853981 | 1.0262760 |
| | 0.3759731 | 0.4869614 | 0.1408915 | 2.2204380 | 2.7032738 | 0.5953888 | 0.3154813 | | | | | |
| 935 | 0.1842334 | 0.1842333 | 0.5184299 | 0.0825174 | 0.0236968 | -0.7490941 | -0.4753742 | 0.7727508 | 0.3493327 | 0.4920847 | 0.7853981 | 1.0255375 |
| | 0.3739650 | 0.4877622 | 0.1393246 | 2.2211914 | 2.7048532 | 0.5941875 | 0.3139690 | | | | | |
| 936 | 0.1831496 | 0.1831496 | 0.5173675 | 0.0814266 | 0.0233765 | -0.7497517 | -0.4757211 | 0.7731282 | 0.3493552 | 0.4920731 | 0.7853981 | 1.0248451 |
| | 0.3719546 | 0.4885617 | 0.1377518 | 2.2219534 | 2.7064323 | 0.5929846 | 0.3124556 | | | | | |
| 937 | 0.1820655 | 0.1820654 | 0.5163045 | 0.0803354 | 0.0230563 | -0.7504116 | -0.4760694 | 0.7734680 | 0.3493779 | 0.4920615 | 0.7853981 | 1.0241489 |
| | 0.3699437 | 0.4893605 | 0.1361719 | 2.2227221 | 2.7080212 | 0.5917830 | 0.3109418 | | | | | |
| 938 | 0.1809800 | 0.1809799 | 0.5152394 | 0.0792434 | 0.0227361 | -0.7510661 | -0.4764141 | 0.7738022 | 0.3493989 | 0.4920502 | 0.7853981 | 1.0234642 |
| | 0.3679293 | 0.4901578 | 0.1346847 | 2.2235012 | 2.7096186 | 0.5905799 | 0.3094263 | | | | | |
| 939 | 0.1799044 | 0.1798943 | 0.5141745 | 0.0781509 | 0.0224159 | -0.7517229 | -0.4767602 | 0.7741387 | 0.3494208 | 0.4920385 | 0.7853981 | 1.0227757 |
| | 0.3659155 | 0.4909546 | 0.1329904 | 2.2242861 | 2.7112226 | 0.5893787 | 0.3079109 | | | | | |
| 940 | 0.1788073 | 0.1788076 | 0.5131075 | 0.0770575 | 0.0220956 | -0.7523792 | -0.4771059 | 0.7744749 | 0.3494414 | 0.4920273 | 0.7853981 | 1.0220981 |
| | 0.3638987 | 0.4917502 | 0.1313884 | 2.2250824 | 2.7128344 | 0.5881769 | 0.3063942 | | | | | |
| 941 | 0.1777207 | 0.1777205 | 0.5121407 | 0.0759638 | 0.0217754 | -0.7530376 | -0.4774526 | 0.7748131 | 0.3494628 | 0.4920157 | 0.7853981 | 1.0213966 |
| | 0.3618815 | 0.4925448 | 0.1297793 | 2.2258844 | 2.7144518 | 0.5869769 | 0.3048772 | | | | | |
| 942 | 0.1766317 | 0.1766316 | 0.5109692 | 0.0748692 | 0.0214552 | -0.7536912 | -0.4777964 | 0.7751464 | 0.3494812 | 0.4920044 | 0.7853981 | 1.0207157 |
| | 0.3598607 | 0.4933370 | 0.1281630 | 2.2266575 | 2.7160788 | 0.5857735 | 0.3033577 | | | | | |
| 943 | 0.1755430 | 0.1755428 | 0.5098996 | 0.0737741 | 0.0211350 | -0.7543466 | -0.4781412 | 0.7754816 | 0.3495014 | 0.4919932 | 0.7853981 | 1.0200319 |
| | 0.3578395 | 0.4941286 | 0.1265390 | 2.2275190 | 2.7177124 | 0.5845734 | 0.3018386 | | | | | |
| 944 | 0.1744531 | 0.1744530 | 0.5088276 | 0.0726792 | 0.0208147 | -0.7550020 | -0.4784858 | 0.7758167 | 0.3495201 | 0.4919822 | 0.7853981 | 1.0193481 |
| | 0.3558170 | 0.4949185 | 0.1249074 | 2.2283487 | 2.7193537 | 0.5833724 | 0.3003184 | | | | | |
| 945 | 0.1733624 | 0.1733623 | 0.5077557 | 0.0715818 | 0.0204945 | -0.7556521 | -0.4788272 | 0.7761466 | 0.3495358 | 0.4919710 | 0.7853981 | 1.0186758 |
| | 0.3537925 | 0.4957070 | 0.1232682 | 2.2291800 | 2.7210035 | 0.5821731 | 0.2987971 | | | | | |
| 946 | 0.1722717 | 0.1722716 | 0.5066840 | 0.0704846 | 0.0201743 | -0.7563088 | -0.4791722 | 0.7764831 | 0.3495600 | 0.4919597 | 0.7853981 | 1.0179901 |
| | 0.3517674 | 0.4964949 | 0.1216207 | 2.2301377 | 2.7226691 | 0.5809754 | 0.2972761 | | | | | |
| 947 | 0.1711801 | 0.1711800 | 0.5056112 | 0.0693869 | 0.0198541 | -0.7569608 | -0.4795145 | 0.7768149 | 0.3495757 | 0.4919487 | 0.7853981 | 1.0173149 |
| | 0.3497407 | 0.4972805 | 0.1199659 | 2.2310959 | 2.7243252 | 0.5797782 | 0.2957539 | | | | | |
| 948 | 0.1700870 | 0.1700869 | 0.5045350 | 0.0682884 | 0.0195338 | -0.7576125 | -0.4798564 | 0.7771463 | 0.3495973 | 0.4919379 | 0.7853981 | 1.0166407 |
| | 0.3477110 | 0.4980637 | 0.1183335 | 2.2317638 | 2.7259979 | 0.5785790 | 0.2942300 | | | | | |
| 949 | 0.1689933 | 0.1689932 | 0.5034571 | 0.0671895 | 0.0192136 | -0.7582662 | -0.4801995 | 0.7774758 | 0.3496141 | 0.4919269 | 0.7853981 | 1.0159636 |
| | 0.3456801 | 0.4988444 | 0.1166338 | 2.2326412 | 2.7276773 | 0.5773797 | 0.2927054 | | | | | |
| 950 | 0.1678985 | 0.1678984 | 0.5023776 | 0.0660856 | 0.0188934 | -0.7589151 | -0.4805396 | 0.7778084 | 0.3496302 | 0.4919161 | 0.7853981 | 1.0152950 |
| | 0.3436667 | 0.4996230 | 0.1149560 | 2.2335300 | 2.7293663 | 0.5761804 | 0.2911795 | | | | | |
| 951 | 0.1668034 | 0.1668033 | 0.5012992 | 0.0649894 | 0.0185732 | -0.7595679 | -0.4808817 | 0.7781417 | 0.3496476 | 0.4919051 | 0.7853981 | 1.0146198 |
| | 0.3416132 | 0.5004000 | 0.1132702 | 2.2344275 | 2.7310619 | 0.5749838 | 0.2896535 | | | | | |
| 952 | 0.1657070 | 0.1657069 | 0.5002165 | 0.0638883 | 0.0182529 | -0.7602185 | -0.4812226 | 0.7784714 | 0.3496621 | 0.4918945 | 0.7853981 | 1.0139494 |
| | 0.3395766 | 0.5011737 | 0.1115767 | 2.2353363 | 2.7327662 | 0.5737844 | 0.2881252 | | | | | |
| 953 | 0.1646097 | 0.1646096 | 0.4991331 | 0.0627867 | 0.0179327 | -0.7608675 | -0.4815623 | 0.7788006 | 0.3496765 | 0.4918836 | 0.7853981 | 1.0132828 |
| | 0.3375362 | 0.5019448 | 0.1098756 | 2.2362566 | 2.7344780 | 0.5725858 | 0.2865973 | | | | | |
| 954 | 0.1635117 | 0.1635116 | 0.4980476 | 0.0616844 | 0.0176125 | -0.7615184 | -0.4819033 | 0.7791308 | 0.3496858 | 0.4918730 | 0.7853981 | 1.0126133 |
| | 0.3354985 | 0.5027133 | 0.1081663 | 2.2371864 | 2.7361975 | 0.5713869 | 0.2850679 | | | | | |
| 955 | 0.1624126 | 0.1624125 | 0.4969605 | 0.0605815 | 0.0172923 | -0.7621678 | -0.4822427 | 0.7794601 | 0.3497028 | 0.4918624 | 0.7853981 | 1.0119467 |
| | 0.3334565 | 0.5034787 | 0.1064490 | 2.2381277 | 2.7379255 | 0.5701883 | 0.2835373 | | | | | |
| 956 | 0.1613126 | 0.1613125 | 0.4958731 | 0.0594777 | 0.0169720 | -0.7628151 | -0.4825811 | 0.7797871 | 0.3497156 | 0.4918515 | 0.7853981 | 1.0112848 |
| | 0.3314128 | 0.5042414 | 0.1047234 | 2.2390904 | 2.7396622 | 0.5689902 | 0.2820057 | | | | | |
| 957 | 0.1602115 | 0.1602114 | 0.4947827 | 0.0583736 | 0.0166518 | -0.7634635 | -0.4829193 | 0.7801153 | 0.3497264 | 0.4918413 | 0.7853981 | 1.0106211 |
| | 0.3293676 | 0.5050005 | 0.1029901 | 2.2400436 | 2.7414064 | 0.5677913 | 0.2804734 | | | | | |
| 958 | 0.1591092 | 0.1590991 | 0.4936912 | 0.0572685 | 0.0163316 | -0.7641124 | -0.4832557 | 0.7803839 | 0.3497444 | 0.4918307 | 0.7853981 | 1.0100784 |
| | 0.3272095 | 0.5057469 | 0.1012481 | 2.2410288 | 2.7431850 | 0.5665928 | 0.2789246 | | | | | |
| 959 | 0.1579961 | 0.1579960 | 0.4925971 | 0.0561631 | 0.0160114 | -0.7647592 | -0.4835839 | 0.7807106 | 0.3497537 | 0.4918201 | 0.7853981 | 1.0094185 |
| | 0.3252501 | 0.5064985 | 0.0994985 | 2.2420158 | 2.7449465 | 0.5653934 | 0.2773895 | | | | | |
| 960 | 0.1568925 | 0.1568524 | 0.4915916 | 0.0550567 | 0.0156911 | -0.7653446 | -0.4839094 | 0.7810357 | 0.3497623 | 0.4918098 | 0.7853981 | 1.0087624 |
| | 0.3231986 | 0.5072471 | 0.0977402 | 2.2431162 | 2.7467165 | 0.5641943 | 0.2758539 | | | | | |
| 961 | 0.1557872 | 0.1557872 | 0.4904040 | 0.0539499 | 0.0153709 | -0.7659876 | -0.4842356 | 0.7813585 | 0.3497659 | 0.4917996 | 0.7853981 | 1.0081120 |
| | 0.3211446 | 0.5079514 | 0.0959738 | 2.2442281 | 2.7484951 | 0.5629947 | 0.2743165 | | | | | |
| 962 | 0.1546820 | 0.1546819 | 0.4893153 | 0.0528422 | 0.0150506 | -0.7666354 | -0.4845735 | 0.7816860 | 0.3497770 | 0.4917890 | 0.7853981 | 1.0074511 |
| | 0.3190903 | 0.5087324 | 0.0941986 | 2.2452514 | 2.7502804 | 0.5617959 | 0.2727792 | | | | | |
| 963 | 0.1535761 | 0.1535760 | 0.4882071 | 0.0517340 | 0.0147305 | -0.7672777 | -0.4849093 | 0.7820081 | 0.3497851 | 0.4917791 | 0.7853981 | 1.0068026 |
| | 0.3170342 | 0.5094699 | 0.0924149 | 2.2462871 | 2.7520761 | 0.5605993 | 0.2712412 | | | | | |



********  ********  ********  *******  **
*******  ********  *******  *****  **

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 964 | 0.1524693 | 0.1524692 | 0.4871070 | 0.0596250 | 0.0144102 | -0.7679267 | -0.4852464 | 0.7823369 | 0.3497922 | 0.4917686 | 0.7853981 | 1.0061407 |
| | 0.3149770 | 0.5102035 | 0.0906222 | 2.2471352 | 2.7538786 | 0.5594025 | -0.2697023 | | | | | |
| 965 | 0.1513616 | 0.1513615 | 0.4860057 | 0.0495154 | 0.0149900 | -0.7685707 | -0.4855916 | 0.7826607 | 0.3497988 | 0.4917587 | 0.7853981 | 1.0054893 |
| | 0.3129171 | 0.5109323 | 0.0988212 | 2.2481985 | 2.7556915 | 0.5582061 | -0.2681626 | | | | | |
| 966 | 0.1502525 | 0.1502528 | 0.4849027 | 0.0484651 | 0.0137697 | -0.7692149 | -0.4859173 | 0.7829847 | 0.3498049 | 0.4917485 | 0.7853981 | 1.0048380 |
| | 0.3108560 | 0.5116567 | 0.0870113 | 2.2492733 | 2.7575130 | 0.5570099 | -0.2666219 | | | | | |
| 967 | 0.1491432 | 0.1491430 | 0.4837968 | 0.0472542 | 0.0134495 | -0.7698560 | -0.4862503 | 0.7833056 | 0.3498088 | 0.4917386 | 0.7853981 | 1.0041933 |
| | 0.3087922 | 0.5123759 | 0.0851932 | 2.2503624 | 2.7593431 | 0.5558125 | -0.2650799 | | | | | |
| 968 | 0.1480324 | 0.1480323 | 0.4826902 | 0.0461824 | 0.0131293 | -0.7704992 | -0.4865947 | 0.7836285 | 0.3498130 | 0.4917287 | 0.7853981 | 1.0035448 |
| | 0.3067265 | 0.5130505 | 0.0833656 | 2.2514648 | 2.7611818 | 0.5546163 | -0.2635368 | | | | | |
| 969 | 0.1469217 | 0.1469216 | 0.4815848 | 0.0450702 | 0.0128091 | -0.7711399 | -0.4869176 | 0.7839490 | 0.3498185 | 0.4917188 | 0.7853981 | 1.0029020 |
| | 0.3046611 | 0.5138007 | 0.0815291 | 2.2525816 | 2.7630310 | 0.5534230 | -0.2619941 | | | | | |
| 970 | 0.1458057 | 0.1458056 | 0.4804765 | 0.0439573 | 0.0124888 | -0.7717829 | -0.4872518 | 0.7842718 | 0.3498229 | 0.4917089 | 0.7853981 | 1.0022545 |
| | 0.3025929 | 0.5145057 | 0.0796835 | 2.2537127 | 2.7649478 | 0.5522291 | -0.2604500 | | | | | |
| 971 | 0.1446971 | 0.1446970 | 0.4793682 | 0.0428434 | 0.0121686 | -0.7724259 | -0.4875861 | 0.7845946 | 0.3498269 | 0.4916990 | 0.7853981 | 1.0016079 |
| | 0.3005238 | 0.5152050 | 0.0778292 | 2.2548571 | 2.7667542 | 0.5510362 | -0.2589054 | | | | | |
| 972 | 0.1435830 | 0.1435829 | 0.4782560 | 0.0417289 | 0.0118484 | -0.7730652 | -0.4879175 | 0.7849136 | 0.3498287 | 0.4916894 | 0.7853981 | 1.0009689 |
| | 0.2984505 | 0.5159582 | 0.0759656 | 2.2560185 | 2.7686300 | 0.5498417 | -0.2573591 | | | | | |
| 973 | 0.1424682 | 0.1424682 | 0.4771415 | 0.0406140 | 0.0115282 | -0.7737070 | -0.4882505 | 0.7852352 | 0.3498295 | 0.4916795 | 0.7853981 | 1.0003252 |
| | 0.2963772 | 0.5165851 | 0.0740934 | 2.2571945 | 2.7705135 | 0.5486470 | -0.2558122 | | | | | |
| 974 | 0.1413521 | 0.1413521 | 0.4760259 | 0.0394581 | 0.0112079 | -0.7743464 | -0.4885821 | 0.7855543 | 0.3498296 | 0.4916700 | 0.7853981 | 0.9996877 |
| | 0.2943005 | 0.5172657 | 0.0722116 | 2.2583857 | 2.7724075 | 0.5474526 | -0.2542639 | | | | | |
| 975 | 0.1402357 | 0.1402357 | 0.4749104 | 0.0383818 | 0.0108877 | -0.7749869 | -0.4889138 | 0.7858747 | 0.3498304 | 0.4916605 | 0.7853981 | 0.9990475 |
| | 0.2922238 | 0.5179406 | 0.0703206 | 2.2595521 | 2.7743101 | 0.5462604 | -0.2527154 | | | | | |
| 976 | 0.1391185 | 0.1391184 | 0.4737942 | 0.0372645 | 0.0105675 | -0.7756258 | -0.4892449 | 0.7861933 | 0.3498313 | 0.4916509 | 0.7853981 | 0.9984111 |
| | 0.2901450 | 0.5186093 | 0.0684198 | 2.2608147 | 2.7762232 | 0.5450694 | -0.2511662 | | | | | |
| 977 | 0.1379917 | 0.1379916 | 0.4726759 | 0.0361467 | 0.0102473 | -0.7762163 | -0.4895695 | 0.7864636 | 0.3498368 | 0.4916414 | 0.7853981 | 0.9978716 |
| | 0.2880486 | 0.5192609 | 0.0665100 | 2.2620640 | 2.7781677 | 0.5438783 | -0.2496040 | | | | | |
| 978 | 0.1368722 | 0.1368722 | 0.4715558 | 0.0350281 | 0.0099271 | -0.7768549 | -0.4898902 | 0.7867819 | 0.3498359 | 0.4916318 | 0.7853981 | 0.9972363 |
| | 0.2859651 | 0.5199149 | 0.0645005 | 2.2633290 | 2.7800989 | 0.5426974 | -0.2480527 | | | | | |
| 979 | 0.1357522 | 0.1357522 | 0.4704338 | 0.0339090 | 0.0096068 | -0.7774922 | -0.4902097 | 0.7870550 | 0.3498338 | 0.4916226 | 0.7853981 | 0.9966041 |
| | 0.2838808 | 0.5205613 | 0.0626618 | 2.2645522 | 2.7820406 | 0.5414965 | -0.2465008 | | | | | |
| 980 | 0.1346312 | 0.1346312 | 0.4693117 | 0.0327889 | 0.0092866 | -0.7781303 | -0.4905403 | 0.7874169 | 0.3498326 | 0.4916130 | 0.7853981 | 0.9959705 |
| | 0.2817944 | 0.5212005 | 0.0607230 | 2.2658135 | 2.7839918 | 0.5403375 | -0.2449479 | | | | | |
| 981 | 0.1335095 | 0.1335094 | 0.4681860 | 0.0316684 | 0.0089664 | -0.7787654 | -0.4908683 | 0.7877318 | 0.3498285 | 0.4916039 | 0.7853981 | 0.9953436 |
| | 0.2797062 | 0.5218313 | 0.0587751 | 2.2671909 | 2.7859526 | 0.5391169 | -0.2433944 | | | | | |
| 982 | 0.1323864 | 0.1323864 | 0.4670594 | 0.0305471 | 0.0086461 | -0.7794045 | -0.4911985 | 0.7880507 | 0.3498245 | 0.4915946 | 0.7853981 | 0.9947092 |
| | 0.2776161 | 0.5224538 | 0.0568171 | 2.2685165 | 2.7879229 | 0.5379273 | -0.2418356 | | | | | |
| 983 | 0.1312627 | 0.1312626 | 0.4659313 | 0.0294251 | 0.0083259 | -0.7800392 | -0.4915264 | 0.7883651 | 0.3498159 | 0.4915854 | 0.7853981 | 0.9940836 |
| | 0.2755240 | 0.5230677 | 0.0548495 | 2.2698612 | 2.7899036 | 0.5367385 | -0.2402843 | | | | | |
| 984 | 0.1301378 | 0.1301377 | 0.4648009 | 0.0283022 | 0.0080057 | -0.7806757 | -0.4918550 | 0.7886814 | 0.3498139 | 0.4915767 | 0.7853981 | 0.9934551 |
| | 0.2734296 | 0.5236728 | 0.0528718 | 2.2712250 | 2.7919943 | 0.5355492 | -0.2387277 | | | | | |
| 985 | 0.1290131 | 0.1290130 | 0.4636740 | 0.0271789 | 0.0076855 | -0.7813091 | -0.4921816 | 0.7889946 | 0.3498114 | 0.4915674 | 0.7853981 | 0.9928328 |
| | 0.2713356 | 0.5242701 | 0.0508839 | 2.2726059 | 2.7939948 | 0.5343656 | -0.2371719 | | | | | |
| 986 | 0.1278865 | 0.1278868 | 0.4625418 | 0.0260546 | 0.0073652 | -0.7819455 | -0.4925101 | 0.7893107 | 0.3498052 | 0.4915586 | 0.7853981 | 0.9922054 |
| | 0.2692396 | 0.5248573 | 0.0488961 | 2.2740078 | 2.7959051 | 0.5331787 | -0.2356146 | | | | | |
| 987 | 0.1267601 | 0.1267601 | 0.4614111 | 0.0249299 | 0.0071453 | -0.7825764 | -0.4928351 | 0.7896214 | 0.3498008 | 0.4915497 | 0.7853981 | 0.9915890 |
| | 0.2671407 | 0.5254349 | 0.0468782 | 2.2754297 | 2.7979269 | 0.5319855 | -0.2340563 | | | | | |
| 988 | 0.1256325 | 0.1256325 | 0.4602783 | 0.0238042 | 0.0069244 | -0.7832140 | -0.4931630 | 0.7899387 | 0.3497952 | 0.4915408 | 0.7853981 | 0.9909599 |
| | 0.2650411 | 0.5260026 | 0.0449595 | 2.2768737 | 2.7999573 | 0.5308123 | -0.2324986 | | | | | |
| 989 | 0.1245040 | 0.1245040 | 0.4591444 | 0.0226780 | 0.0066946 | -0.7838449 | -0.4934889 | 0.7902495 | 0.3497894 | 0.4915320 | 0.7853981 | 0.9903441 |
| | 0.2629354 | 0.5265558 | 0.0429316 | 2.2783337 | 2.8019921 | 0.5296301 | -0.2309354 | | | | | |
| 990 | 0.1233745 | 0.1233745 | 0.4580089 | 0.0215518 | 0.0064643 | -0.7844777 | -0.4938148 | 0.7905620 | 0.3497830 | 0.4915231 | 0.7853981 | 0.9897252 |
| | 0.2608355 | 0.5271061 | 0.0407927 | 2.2798176 | 2.8040514 | 0.5284485 | -0.2293795 | | | | | |
| 991 | 0.1222370 | 0.1222370 | 0.4568728 | 0.0204232 | 0.0062341 | -0.7851027 | -0.4941391 | 0.7908748 | 0.3497815 | 0.4915143 | 0.7853981 | 0.9891052 |
| | 0.2587172 | 0.5276313 | 0.0387437 | 2.2813339 | 2.8061323 | 0.5272684 | -0.2278233 | | | | | |
| 992 | 0.1211130 | 0.1211129 | 0.4557368 | 0.0192947 | 0.0059939 | -0.7857447 | -0.4944671 | 0.7911885 | 0.3497654 | 0.4915057 | 0.7853981 | 0.9884858 |
| | 0.2566237 | 0.5281644 | 0.0366840 | 2.2828533 | 2.8081865 | 0.5260887 | -0.2262576 | | | | | |
| 993 | 0.1199737 | 0.1199737 | 0.4545948 | 0.0181657 | 0.0057537 | -0.7863246 | -0.4947902 | 0.7914982 | 0.3497658 | 0.4914972 | 0.7853981 | 0.9878526 |
| | 0.2545014 | 0.5286656 | 0.0346141 | 2.2844105 | 2.8102884 | 0.5249091 | -0.2246857 | | | | | |
| 994 | 0.1188402 | 0.1188401 | 0.4534534 | 0.0170357 | 0.0055134 | -0.7869037 | -0.4951124 | 0.7917971 | 0.3497571 | 0.4914886 | 0.7853981 | 0.9872125 |
| | 0.2523897 | 0.5291637 | 0.0325333 | 2.2859850 | 2.8123837 | 0.5237304 | -0.2231223 | | | | | |
| 995 | 0.1177071 | 0.1177071 | 0.4523134 | 0.0159052 | 0.0052732 | -0.7875055 | -0.4954413 | 0.7920787 | 0.3497457 | 0.4914802 | 0.7853981 | 0.9865715 |
| | 0.2502785 | 0.5296507 | 0.0304420 | 2.2875605 | 2.8144884 | 0.5225555 | -0.2215601 | | | | | |
| 996 | 0.1165726 | 0.1165726 | 0.4511705 | 0.0147737 | 0.0049331 | -0.7880266 | -0.4957715 | 0.7923456 | 0.3497409 | 0.4914716 | 0.7853981 | 0.9861140 |
| | 0.2481652 | 0.5301237 | 0.0283396 | 2.2892017 | 2.8166037 | 0.5213798 | -0.2199966 | | | | | |
| 997 | 0.1154373 | 0.1154373 | 0.4500269 | 0.0136418 | 0.0045923 | -0.7885572 | -0.4961053 | 0.7926999 | 0.3497317 | 0.4914635 | 0.7853981 | 0.9855021 |
| | 0.2460456 | 0.5305827 | 0.0262265 | 2.2908468 | 2.8187304 | 0.5202156 | -0.2184325 | | | | | |
| 998 | 0.1143007 | 0.1143006 | 0.4488811 | 0.0125089 | 0.0042515 | -0.7890856 | -0.4964379 | 0.7930081 | 0.3497220 | 0.4914550 | 0.7853981 | 0.9848946 |
| | 0.2439321 | 0.5310271 | 0.0241028 | 2.2925177 | 2.8208685 | 0.5190418 | -0.2168671 | | | | | |
| 999 | 0.1131641 | 0.1131641 | 0.4477361 | 0.0113755 | 0.0039123 | -0.7896114 | -0.4967704 | 0.7933165 | 0.3497131 | 0.4914468 | 0.7853981 | 0.9842874 |
| | 0.2418140 | 0.5314578 | 0.0219681 | 2.2942142 | 2.8230171 | 0.5178610 | -0.2153025 | | | | | |

```
                                                  0.0020821-0.7907459-0.4970343 0.7936280 0.3497022 0.4914386 0.7853981 0.9836744
     0.2296934 0.5318727 0.0198221 2.2959366 2.8251762 0.5166892 0.2137365
1001 0.1108876 0.1108875 0.4454400 0.0021063 0.0025619-0.7913737-0.4973562 0.7939356 0.3496923 0.4914304 0.7853981 0.9830693
     0.2375715 0.5322723 0.0176653 2.2976866 2.8273468 0.5155204 0.2121705
1002 0.1097471 0.1097471 0.4442865 0.0079705 0.0022416-0.7920026-0.4976782 0.7942442 0.3496784 0.4514222 0.7853581 0.9824626
     0.2354461 0.5326537 0.0154970 2.2994642 2.8295208 0.5143481 0.2106025
1003 0.1086062 0.1086062 0.4431344 0.0068342 0.0019214-0.7926274-0.4979581 0.7945488 0.3496663 0.4914144 0.7853581 0.9818642
     0.2333195 0.5330150 0.0133178 2.3012705 2.8317232 0.5131798 0.2090346
1004 0.1074581 0.1074581 0.4419803 0.0056970 0.0016012-0.7932216-0.4583016 0.7948228 0.3496575 0.4914062 0.7853581 0.9813263
     0.2311795 0.5333567 0.0111268 2.3031158 2.9339434 0.5120119 0.2074574
1005 0.1063156 0.1063156 0.4408250 0.0045592 0.0012810-0.7938479-0.4986219 0.7951288 0.3496439 0.4913984 0.7853981 0.9807256
     0.2290497 0.5336863 0.0089249 2.3049803 2.8361597 0.5108453 0.2058887
1006 0.1051721 0.1051720 0.4356697 0.0034274 0.0009607-0.7944739-0.4989421 0.7954347 0.3496311 0.4513905 0.7853981 0.9801258
     0.2269180 0.5339574 0.0067110 2.3068752 2.8383884 0.5096811 0.2043193
1007 0.1040274 0.1040273 0.4385107 0.0022812 0.0006405-0.7950981-0.4992613 0.7957366 0.3496159 0.4913827 0.7853581 0.9795303
     0.2247840 0.5342882 0.0044860 2.3088017 2.8436286 0.5085158 0.2027491
1008 0.1028810 0.1028809 0.4373468 0.0011410 0.0003203-0.7957215-0.4995797 0.7960418 0.3495975 0.4913753 0.7853581 0.9789361
     0.2276465 0.5345577 0.0022489 2.3107615 2.8428802 0.5073480 0.2011772
1009 0.1017346 0.1017346 0.4361849 0.0000002 0.0000001-0.7963483-0.4998997 0.7963484 0.3495810 0.4913674 0.7853981 0.9783359
     0.2205091 0.5348079 0.0000004 2.3127527 2.8451424 0.5361849 0.1996064
  0.43618   0.62164   2.56381 -0.50618
1 IMAGE PLANE SPOT DIAGRAM ANALYSIS:

 THICKNESS =0.0500000  U =0.0        ALFAP =0.0        R =1.0000000

 CENTROID: ZCENTR = 0.0,  YCENTR =  0.0027303

 STANDARD DEVIATIONS:  SIGMAY =  0.0000085  SIGMAZ =  0.0000194

 RMS SPOT SIZE: RMSRAD =  0.0052860

 SPOT DIAGRAM ENERGY DENSITY VS. RADIUS FROM CENTROID:
  IZ4    RADIUS    FRACTION

   1  0.0050000  0.6776316
   2  0.0100000  0.5605263
   3  0.0150000  0.9835526
   4  0.0200000  1.0000000
   5  0.0250000  1.0000000
   6  0.0300000  1.0000000
   7  0.0350000  1.0000000
   8  0.0400000  1.0000000
   9  0.0450000  1.0000000
  10  0.0500000  1.0000000
  11  0.0550000  1.0000000
  12  0.0600000  1.0000000
  13  0.0649999  1.0000000
  14  0.0699999  1.0000000
  15  0.0749999  1.0000000
  16  0.0799999  1.0000000
  17  0.0849999  1.0000000
  18  0.0899999  1.0000000
  19  0.0949999  1.0000000
  20  0.0999999  1.0000000
  21  0.1049999  1.0000000
  22  0.1099999  1.0000000
  23  0.1149999  1.0000000
  24  0.1199999  1.0000000
  25  0.1249999  1.0000000
  26  0.1299999  1.0000000
  27  0.1349999  1.0000000
  28  0.1399999  1.0000000
  29  0.1449999  1.0000000
  30  0.1499999  1.0000000
  31  0.1549999  1.0000000
  32  0.1599998  1.0000000
  33  0.1649998  1.0000000
  34  0.1699998  1.0000000
```

```
 35  0.1749998E  1.0000000
 36  0.1799998E  1.0000000
 37  0.1849998E  1.0000000
 38  0.1899998E  1.0000000
 39  0.1949998E  1.0000000
 40  0.1999998E  1.0000000
 41  0.2049998E  1.0000000
 42  0.2099998E  1.0000000
 43  0.2149998E  1.0000000
 44  0.2199998E  1.0000000
 45  0.2249998E  1.0000000
 46  0.2299998E  1.0000000
 47  0.2349998E  1.0000000
 48  0.2399998E  1.0000000
 49  0.2449998E  1.0000000
 50  0.2499998E  1.0000000
 51  0.2549998E  1.0000000
 52  0.2599998E  1.0000000
 53  0.2649998E  1.0000000
 54  0.2699997E  1.0000000
 55  0.2749997E  1.0000000
 56  0.2799997E  1.0000000
 57  0.2849997E  1.0000000
 58  0.2899997E  1.0000000
 59  0.2949997E  1.0000000
 60  0.2999997E  1.0000000
 61  0.3049997E  1.0000000
 62  0.3099997E  1.0000000
 63  0.3149997E  1.0000000
 64  0.3199997E  1.0000000
 65  0.3249997E  1.0000000
 66  0.3299997E  1.0000000
 67  0.3349997E  1.0000000
 68  0.3399997E  1.0000000
 69  0.3449997E  1.0000000
 70  0.3499997E  1.0000000
 71  0.3549997E  1.0000000
 72  0.3599997E  1.0000000
 73  0.3649997E  1.0000000
 74  0.3699996E  1.0000000
 75  0.3749996E  1.0000000
 76  0.3799996E  1.0000000
 77  0.3849996E  1.0000000
 78  0.3899996E  1.0000000
 79  0.3949996E  1.0000000
 80  0.3999996E  1.0000000
 81  0.4049996E  1.0000000
 82  0.4099996E  1.0000000
 83  0.4149996E  1.0000000
 84  0.4199996E  1.0000000
 85  0.4249996E  1.0000000
 86  0.4299996E  1.0000000
 87  0.4349996E  1.0000000
 88  0.4399996E  1.0000000
 89  0.4449996E  1.0000000
 90  0.4499996E  1.0000000
 91  0.4549996E  1.0000000
 92  0.4599996E  1.0000000
 93  0.4649996E  1.0000000
 94  0.4699996E  1.0000000
 95  0.4749995E  1.0000000
 96  0.4799995E  1.0000000
 97  0.4849995E  1.0000000
 98  0.4899995E  1.0000000
 99  0.4949995E  1.0000000
100  0.4999995E  1.0000000
SPOT DIAGRAM CALCULATIONS COMPLETE.
TO OBTAIN PLOTS FROM THE PLOTTER OR THE PRINTER,
ISSUE THE FOLLOWING COMMAND:
        FOR PRINTER PLOTS          ENTER "LENSCOM PRINTER"
        FOR PLOTTER GRAPHS         ENTER "LENSCOM PLOTTER"
END OF PROGRAM
```

GRIN PARAMETERS(2):

ALPHA = 0.7853579 BETA = 0.3227880 RADIUS = 1.00000 INCIDENT ANGLE = 0.0 ITERATIONS = 1008

EDGE THICKNESS = 0.0500000 INDICES OF REFRACTION: N1 = 1.00000 N2 = 1.42157 N3 = 1.00000

FOCAL LENGTH FROM STATION ZERO = 4.00000 DELTA BETA= 0.00032

CENTER OF SYM(XC)=-0.07000 CHANGE IN N2(X)=-0.050 ALFAP= 0.0

NOTE:X-COORDINATES HAS BEEN SHIFTED IN CASE=2 BY X2(K);NOW,X2(K)=0.0 ETC.

| J | X1 | Y1 | X2 | Y2 | BETA | I2P | I2 | ETA | T | I1P | I1 | DYDXT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | E | THETAE | THETAO | PSI | PSIO | RR | RF | | | | | |
| | 0.43618 | 0.62164 | 3.56381 | -0.50618 | | | | | | | | |

ISKEW RAY TRACE PARAPETERS:

ALFAP= 0.0 GRID= 0.1000000 SEE LENS PARAMETERS ABOVE.

| RAY | RAYY<br>PHII | RAYZ<br>PHIIP | XO<br>CKPP | YO<br>CLPP | XI<br>CMPP | YI<br>D3 | ZI<br>D1 | OPL<br>NUM6 | YIM<br>NUM7 | ZIM<br>NUM8 | NTNCTY | XDIAPT | YDIAPT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.0 | 0.20000 | -0.23618 | 0.0 | 0.09771 | 0.00036 | 0.09844 | 4.24078 | 0.00549 | -0.01646 | 1.00000 | -0.603E-01 | 0.475E-02 |
| | 0.4641 | 0.7285 | 0.9995 | 0.0015 | -0.0331 | 3.4680 | 0.4362 | 0.2000 | 0.0 | -0.5837 | | | |
| 2 | 0.0 | 0.30000 | -0.13618 | 0.0 | 0.19229 | 0.00044 | 0.20024 | 4.17358 | 0.00319 | -0.00311 | 1.00000 | 0.385E+00 | 0.315E-02 |
| | 0.4326 | 0.6704 | 0.9982 | 0.0008 | -0.0602 | 3.3776 | 0.4362 | 0.3000 | 0.0 | -0.5618 | | | |
| 3 | 0.0 | 0.40000 | -0.03618 | 0.0 | 0.28135 | 0.00060 | 0.30392 | 4.09773 | 0.00280 | -0.00462 | 1.00000 | 0.387E+00 | 0.277E-02 |
| | 0.3878 | 0.5919 | 0.9956 | 0.0007 | -0.0936 | 3.2969 | 0.4362 | 0.4000 | 0.0 | -0.5361 | | | |
| 4 | 0.0 | 0.50000 | 0.06382 | 0.0 | 0.36367 | 0.00117 | 0.40984 | 4.01756 | 0.00395 | -0.00300 | 1.00000 | 0.413E+00 | 0.393E-02 |
| | 0.3347 | 0.5033 | 0.9918 | 0.0009 | -0.1279 | 3.2267 | 0.4362 | 0.5000 | 0.0 | -0.5107 | | | |
| 5 | 0.0 | 0.60000 | 0.16382 | 0.0 | 0.43781 | 0.00167 | 0.51836 | 3.93575 | 0.00434 | -0.00165 | 1.00000 | 0.426E+00 | 0.433E-02 |
| | 0.2700 | 0.3999 | 0.9864 | 0.0008 | -0.1641 | 3.1690 | 0.4362 | 0.6000 | 0.0 | -0.4860 | | | |
| 6 | 0.0 | 0.70000 | 0.26382 | 0.0 | 0.50243 | 0.00217 | 0.62983 | 3.85365 | 0.00445 | -0.00103 | 1.00000 | 0.431E+00 | 0.448E-02 |
| | 0.1914 | 0.2796 | 0.9794 | 0.0007 | -0.2018 | 3.1257 | 0.4362 | 0.7000 | 0.0 | -0.4633 | | | |
| 7 | 0.0 | 0.80000 | 0.36382 | 0.0 | 0.55575 | 0.00214 | 0.74449 | 3.77239 | 0.00363 | -0.00250 | 1.00000 | 0.426E+00 | 0.362E-02 |
| | 0.0970 | 0.1401 | 0.9705 | 0.0005 | -0.2417 | 3.0994 | 0.4362 | 0.8000 | 0.0 | -0.4445 | | | |
| 8 | 0.0 | 0.90000 | 0.46382 | 0.0 | 0.59604 | 0.00277 | 0.86261 | 3.69061 | 0.00392 | -0.00040 | 1.00000 | 0.435E+00 | 0.392E-02 |
| | 0.0083 | 0.0118 | 0.9602 | 0.0004 | -0.2752 | 3.0997 | 0.4362 | 0.9000 | 0.0 | -0.4317 | | | |
| 9 | 0.10000 | 0.10000 | -0.29476 | 0.10000 | 0.14001 | 0.02812 | 0.02787 | 4.27035 | -0.00538 | -0.01471 | 1.00000 | -0.781E+00 | 0.619E-02 |
| | 0.4836 | 0.7652 | 0.9999 | -0.0055 | -0.0121 | 3.5242 | 0.4362 | 0.1414 | 0.1000 | -0.5977 | | | |
| 10 | 0.10000 | 0.20000 | -0.21256 | 0.10000 | 0.12048 | 0.05511 | 0.10920 | 4.22624 | 0.00037 | -0.01163 | 1.00000 | 0.105E+00 | 0.564E-02 |
| | 0.4583 | 0.7175 | 0.9993 | -0.0159 | -0.0351 | 3.4459 | 0.4362 | 0.2236 | 0.1000 | -0.5702 | | | |
| 11 | 0.10000 | 0.30000 | -0.11596 | 0.10000 | 0.23713 | 0.06897 | 0.23568 | 4.16185 | 0.00187 | -0.01572 | 1.00000 | 0.345E+00 | 0.272E-02 |
| | 0.4252 | 0.6571 | 0.9978 | -0.0202 | -0.0629 | 3.3643 | 0.4362 | 0.3162 | 0.1000 | -0.5573 | | | |
| 12 | 0.10000 | 0.40000 | -0.03387 | 0.10000 | 0.29184 | 0.07773 | 0.39716 | 4.08773 | 0.00364 | -0.00227 | 1.00000 | 0.412E+00 | 0.418E-02 |
| | 0.3833 | 0.5941 | 0.9953 | -0.0225 | -0.0941 | 3.2874 | 0.4362 | 0.4123 | 0.1000 | -0.5335 | | | |
| 13 | 0.10000 | 0.50000 | 0.07372 | 0.10000 | 0.37143 | 0.08376 | 0.41203 | 4.00929 | 0.00421 | -0.00129 | 1.00000 | 0.427E+00 | 0.444E-02 |
| | 0.3392 | 0.4959 | 0.9914 | -0.0247 | -0.1283 | 3.2200 | 0.4362 | 0.5099 | 0.1000 | -0.5085 | | | |
| 14 | 0.10000 | 0.60000 | 0.17209 | 0.10000 | 0.44359 | 0.08831 | 0.52332 | 3.92863 | 0.00413 | -0.00027 | 1.00000 | 0.435E+00 | 0.417E-02 |
| | 0.2852 | 0.3924 | 0.9860 | -0.0266 | -0.1644 | 3.1644 | 0.4362 | 0.6083 | 0.1000 | -0.4942 | | | |
| 15 | 0.10000 | 0.70000 | 0.27092 | 0.10000 | 0.51663 | 0.09231 | 0.63113 | 3.84831 | 0.00382 | -0.00388 | 1.00000 | 0.418E+00 | 0.436E-02 |

```
     0.1837  0.2682  0.9787 -0.0283 -0.2039  3.1237  0.4362  0.7071  0.1000 -0.4617

16 0.10000 0.80000 0.37004 0.10000 0.55858 0.09546 0.74569 3.76727 0.00341-0.00272 1.00000  0.425E+00 0.375E-02
   0.0909  0.1311  0.9659 -0.0297 -0.2415  3.0984  0.4362  0.8062  0.1000 -0.4436

17 0.10000 0.50000 0.46935 0.10000 0.59788 0.09831 0.86267 3.68702 0.00298-0.00274 1.00000  0.427E+00 0.328E-02
   0.0159  0.0228  0.9594 -0.0308 -0.2803  3.0914  0.4362  0.9055  0.1000 -0.4312

18 0.20000 0.0    -0.23618 0.20000 0.09779 0.09864 0.00036 4.24076-0.01524 0.00549 1.00000 -0.327E+01 0.106E+00
   0.4646  0.7293  0.9955 -0.0328  0.0015  3.4680  0.4362  0.2000  0.2000 -0.5839

19 0.20000 0.10000-0.21258 0.20000 0.12046 0.10960 0.05431 4.22611-0.00336-0.00765 1.00000  0.112E-01 0.106E-01
   0.4598  0.7201  0.9953 -0.0328 -0.0180  3.4458  0.4362  0.2236  0.2000 -0.5799

20 0.20000 0.20000-0.15334 0.20000 0.17644 0.12939 0.12891 4.18596-0.00220-0.00414 1.00000  0.331E+00 0.383E-02
   0.4394  0.6826  0.9985 -0.0382 -0.0352  3.3925  0.4362  0.2828  0.2000 -0.5661

21 0.20000 0.30000-0.07563 0.20000 0.24692 0.14641 0.21823 4.12814 0.00263-0.00368 1.00000  0.381E+00 0.501E-02
   0.4076  0.6261  0.9968 -0.0432 -0.0667  3.3274  0.4362  0.3606  0.2000 -0.5467

22 0.20000 0.40000 0.01103 0.20000 0.32110 0.15879 0.31599 4.06009 0.00133-0.00363 1.00000  0.355E+00 0.312E-02
   0.3646  0.5527  0.9949 -0.0483 -0.0980  3.2622  0.4362  0.4472  0.2000 -0.5242

23 0.20000 0.50000 0.10233 0.20000 0.39328 0.16936 0.41833 3.98578 0.00542-0.00181 1.00000  0.423E+00 0.613E-02
   0.3128  0.4677  0.9903 -0.0512 -0.1312  3.2024  0.4362  0.5385  0.2000 -0.5014

24 0.20000 0.60000 0.19627 0.20000 0.45995 0.17691 0.52520 3.90911 0.00352-0.00268 1.00000  0.420E+00 0.440E-02
   0.2460  0.3628  0.9844 -0.0550 -0.1674  3.1532  0.4362  0.6325  0.2000 -0.4783

25 0.20000 0.70000 0.29183 0.20000 0.51857 0.18395 0.63552 3.83108 0.00356-0.00372 1.00000  0.418E+00 0.461E-02
   0.1656  0.2411  0.9770 -0.0579 -0.2051  3.1168  0.4362  0.7280  0.2000 -0.4575

26 0.20000 0.80000 0.38044 0.20000 0.56688 0.19036 0.74948 3.75199 0.00435-0.00158 1.00000  0.428E+00 0.484E-02
   0.0730  0.1052  0.9682 -0.0601 -0.2428  3.0953  0.4362  0.8246  0.2000 -0.4408

27 0.20000 0.90000 0.48577 0.20000 0.60297 0.19568 0.86720 3.67387 0.00328-0.00340 1.00000  0.425E+00 0.403E-02
   0.0347  0.0496  0.9575 -0.0622 -0.2816  3.0922  0.4362  0.9220  0.2000 -0.4298

28 0.30000 0.0    -0.13618 0.30000 0.19230 0.20024 0.00097 4.17358-0.00307 0.00707 1.00000 -0.347E+01 0.232E+00
   0.4326  0.6704  0.9982 -0.0602  0.0018  3.3776  0.4362  0.3000  0.3000 -0.5618

29 0.30000 0.10000-0.11596 0.30000 0.20713 0.20594 0.06819 4.16185-0.00396-0.00440 1.00000  0.233E+00 0.877E-02
   0.4252  0.6571  0.9978 -0.0624 -0.0216  3.3640  0.4362  0.3162  0.3000 -0.5573

30 0.30000 0.20000-0.07563 0.30000 0.24692 0.21916 0.14502 4.12814 0.00143-0.00504 1.00000  0.325E+00 0.874E-02
   0.4076  0.6261  0.9968 -0.0654 -0.0451  3.3274  0.4362  0.3606  0.3000 -0.5467

31 0.30000 0.30000-0.01192 0.30000 0.30198 0.23383 0.23202 4.07840 0.00190-0.00588 1.00000  0.356E+00 0.763E-02
   0.3765  0.5727  0.9949 -0.0707 -0.0726  3.2787  0.4362  0.4243  0.3000 -0.5301

32 0.30000 0.40000 0.06382 0.30000 0.36367 0.24732 0.32703 4.01757 0.00198-0.00520 1.00000  0.386E+00 0.582E-02
   0.3347  0.5033  0.9918 -0.0759 -0.1030  3.2267  0.4362  0.5000  0.3000 -0.5107

33 0.30000 0.50000 0.14691 0.30000 0.42596 0.25818 0.42796 3.94969 0.00168-0.00351 1.00000  0.411E+00 0.377E-02
   0.2816  0.4183  0.9874 -0.0807 -0.1358  3.1777  0.4362  0.5831  0.3000 -0.4910

34 0.30000 0.60000 0.23464 0.30000 0.48477 0.26696 0.53392 3.87759-0.00141-0.00280 1.00000  0.420E+00 0.119E-05
   0.2146  0.3147  0.9815 -0.0855 -0.1711  3.1373  0.4362  0.6708  0.3000 -0.4694

35 0.30000 0.70000 0.32539 0.30000 0.53668 0.27842 0.64230 3.80363 0.00390-0.00428 1.00000  0.416E+00 0.572E-02
   0.1346  0.1952  0.9741 -0.0883 -0.2181  3.1076  0.4362  0.7616  0.3000 -0.4511

36 0.30000 0.80000 0.41822 0.30000 0.57540 0.28627 0.75594 3.72776 0.00361-0.00184 1.00000  0.425E+00 0.428E-02
   0.0419  0.0602  0.9652 -0.0914 -0.2451  3.0921  0.4362  0.8544  0.3000 -0.4367

37 0.30000 0.90000 0.51250 0.30000 0.61044 0.29407 0.87217 3.65245 0.00266-0.00375 1.00000  0.424E+00 0.391E-02
   0.0656  0.0937  0.9544 -0.0942 -0.2834  3.0946  0.4362  0.9487  0.3000 -0.4281

38 0.40000 0.0    -0.03618 0.40000 0.28135 0.30302 0.30091 4.09772-0.00462 0.00428 1.00000 -0.374E+01 0.388E+00
   0.3878  0.5919  0.9956 -0.0936  0.0110  3.2969  0.4362  0.4000  0.4000 -0.5361

39 0.40000 0.10000-0.02387 0.40000 0.29195 0.30778 0.07525 4.08773 0.00256-0.00749 1.00000  0.140E+02 0.283E-01
```

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.3833 | C.5841 | C.9953 | -0.0935 | -0.0252 | 3.2874 | 0.4362 | 0.4123 | 0.4000 | -0.5335 | | | |
| 40 | 0.40000 | C.20000 | 0.01103 | 0.40000 | 0.32110 | 0.31664 | 0.15748 | 4.06005 | -0.00103 | -0.00387 | 1.00000 | 0.358E+00 | 0.659E-02 |
| | 0.3646 | C.5527 | 0.9940 | -0.0974 | -0.0455 | 3.2622 | 0.4362 | 0.4472 | 0.4000 | -0.5242 | | | |
| 41 | 0.40000 | C.30000 | 0.06382 | 0.40000 | 0.36367 | 0.32879 | 0.24468 | 4.01758 | 0.00072 | -0.00551 | 1.00000 | 0.361E+00 | 0.846E-02 |
| | 0.3347 | C.5033 | 0.9918 | -0.1017 | -0.0777 | 3.2267 | 0.4362 | 0.5000 | 0.4000 | -0.5107 | | | |
| 42 | 0.40000 | C.40000 | 0.12950 | 0.40000 | 0.41340 | 0.34110 | 0.33886 | 3.96364 | 0.00306 | -0.00332 | 1.00000 | 0.406E+00 | 0.628E-02 |
| | 0.2947 | C.4388 | 0.9885 | -0.1061 | -0.1074 | 3.1869 | 0.4362 | 0.5657 | 0.4000 | -0.4945 | | | |
| 43 | 0.40000 | C.50000 | 0.20413 | 0.40000 | 0.46516 | 0.35325 | 0.43826 | 3.90272 | 0.00270 | -0.00441 | 1.00000 | 0.405E+00 | 0.618E-02 |
| | 0.2398 | C.3591 | 0.9838 | -0.1113 | -0.1405 | 3.1497 | 0.4362 | 0.6403 | 0.4000 | -0.4764 | | | |
| 44 | 0.40000 | C.60000 | 0.28433 | 0.40000 | 0.51468 | 0.36474 | 0.54254 | 3.83673 | 0.00265 | -0.00501 | 1.00000 | 0.408E+00 | 0.600E-02 |
| | 0.1788 | C.2503 | 0.9776 | -0.1161 | -0.1756 | 3.1190 | 0.4362 | 0.7211 | 0.4000 | -0.4585 | | | |
| 45 | 0.40000 | C.70000 | 0.37004 | 0.40000 | 0.55859 | 0.37544 | 0.65131 | 3.76727 | 0.00298 | -0.00432 | 1.00000 | 0.416E+00 | 0.543E-02 |
| | 0.1309 | C.1311 | 0.9699 | -0.1202 | -0.2116 | 3.0984 | 0.4362 | 0.8062 | 0.4000 | -0.4436 | | | |
| 46 | 0.40000 | C.80000 | 0.45824 | 0.40000 | 0.59417 | 0.38564 | 0.76414 | 3.69571 | 0.00341 | -0.00338 | 1.00000 | 0.423E+00 | 0.509E-02 |
| | 0.0890 | C.0043 | 0.9608 | -0.1237 | -0.2483 | 3.0910 | 0.4362 | 0.8944 | 0.4000 | -0.4322 | | | |
| 47 | 0.40000 | C.90000 | 0.54870 | 0.40000 | 0.61881 | 0.39557 | 0.88079 | 3.62402 | 0.00236 | -0.00556 | 1.00000 | 0.416E+00 | 0.501E-02 |
| | 0.1054 | C.1561 | 0.9468 | -0.1268 | -0.2869 | 3.1006 | 0.4362 | 0.9849 | 0.4000 | -0.4267 | | | |
| 48 | 0.50000 | C.0 | 0.06382 | 0.50000 | 0.36367 | 0.40984 | 0.00169 | 4.01756 | -0.00300 | 0.00571 | 1.00000 | -0.411E+01 | 0.584E+00 |
| | 0.3347 | C.5033 | 0.9518 | -0.1279 | 0.0012 | 3.2266 | 0.4362 | 0.5000 | 0.5000 | -0.5107 | | | |
| 49 | 0.50000 | C.10000 | 0.07372 | 0.50000 | 0.37144 | 0.41274 | 0.08019 | 4.00519 | 0.00113 | -0.00750 | 1.00000 | 0.163E+00 | 0.363E-01 |
| | 0.3202 | C.4959 | 0.9914 | -0.1278 | -0.0272 | 3.2209 | 0.4362 | 0.5099 | 0.5000 | -0.5085 | | | |
| 50 | 0.50000 | C.20000 | 0.10233 | 0.50000 | 0.39227 | 0.41948 | 0.16649 | 3.98578 | 0.00167 | -0.00327 | 1.00000 | 0.375E+00 | 0.971E-02 |
| | 0.3128 | C.4677 | 0.9900 | -0.1305 | -0.0530 | 3.2125 | 0.4362 | 0.5385 | 0.5000 | -0.5014 | | | |
| 51 | 0.50000 | C.30000 | 0.14691 | 0.50000 | 0.42596 | 0.42944 | 0.25572 | 3.94565 | 0.00146 | -0.00497 | 1.00000 | 0.376E+00 | 0.863E-02 |
| | 0.2816 | C.4183 | 0.9874 | -0.1350 | -0.0820 | 3.1778 | 0.4362 | 0.5831 | 0.5000 | -0.4900 | | | |
| 52 | 0.50000 | C.40000 | 0.20413 | 0.50000 | 0.46517 | 0.44087 | 0.34559 | 3.90273 | 0.00173 | -0.00459 | 1.00000 | 0.393E+00 | 0.790E-02 |
| | 0.2398 | C.3531 | 0.9838 | -0.1394 | -0.1127 | 3.1497 | 0.4362 | 0.6403 | 0.5000 | -0.4764 | | | |
| 53 | 0.50000 | C.50000 | 0.27092 | 0.50000 | 0.50663 | 0.45294 | 0.44510 | 3.84831 | 0.00157 | -0.00624 | 1.00000 | 0.394E+00 | 0.775E-02 |
| | 0.1837 | C.2682 | 0.9787 | -0.1445 | -0.1459 | 3.1237 | 0.4362 | 0.7071 | 0.5000 | -0.4617 | | | |
| 54 | 0.50000 | C.60000 | 0.34484 | 0.50000 | 0.54655 | 0.46503 | 0.55254 | 3.78745 | 0.00375 | -0.00440 | 1.00000 | 0.412E+00 | 0.743E-02 |
| | 0.1369 | C.1651 | 0.9724 | -0.1487 | -0.1796 | 3.1028 | 0.4362 | 0.7813 | 0.5000 | -0.4478 | | | |
| 55 | 0.50000 | C.70000 | 0.42405 | 0.50000 | 0.58166 | 0.47688 | 0.66121 | 3.72307 | 0.00425 | -0.00378 | 1.00000 | 0.419E+00 | 0.694E-02 |
| | 0.1055 | C.0510 | 0.9646 | -0.1529 | -0.2151 | 3.0917 | 0.4362 | 0.8602 | 0.5000 | -0.4360 | | | |
| 56 | 0.50000 | C.80000 | 0.50721 | 0.50000 | 0.60510 | 0.48774 | 0.77408 | 3.65605 | 0.00336 | -0.00291 | 1.00000 | 0.425E+00 | 0.517E-02 |
| | 0.0580 | C.0829 | 0.9552 | -0.1566 | -0.2512 | 3.0933 | 0.4362 | 0.9434 | 0.5000 | -0.4283 | | | |
| 57 | 0.60000 | C.0 | 0.16382 | 0.60000 | 0.43792 | 0.51936 | 0.00217 | 3.53574 | -0.00166 | 0.00562 | 1.00000 | -0.466E+01 | 0.845E+00 |
| | 0.2700 | C.3959 | 0.9864 | -0.1641 | 0.0011 | 3.1689 | 0.4362 | 0.6000 | 0.6000 | -0.4960 | | | |
| 58 | 0.60000 | C.10000 | 0.17209 | 0.60000 | 0.44360 | 0.52028 | 0.08674 | 3.52863 | 0.00041 | 0.00013 | 1.00000 | 0.441E+00 | -0.359E-03 |
| | 0.2652 | C.3923 | 0.9860 | -0.1643 | -0.0274 | 3.1644 | 0.4362 | 0.6083 | 0.6000 | -0.4842 | | | |
| 59 | 0.60000 | C.20000 | 0.19627 | 0.60000 | 0.45695 | 0.52662 | 0.17262 | 3.50911 | 0.00073 | -0.00675 | 1.00000 | 0.319E+00 | 0.205E-01 |
| | 0.2460 | C.3628 | 0.9844 | -0.1668 | -0.0569 | 3.1532 | 0.4362 | 0.6325 | 0.6000 | -0.4783 | | | |
| 60 | 0.60000 | C.30000 | 0.23464 | 0.60000 | 0.48472 | 0.53393 | 0.26695 | 3.47799 | -0.00280 | -0.00142 | 1.00000 | 0.420E+00 | 0.341E-04 |
| | 0.2146 | C.3147 | 0.9815 | -0.1711 | -0.0856 | 3.1373 | 0.4362 | 0.6718 | 0.6000 | -0.4694 | | | |
| 61 | 0.60000 | C.40000 | 0.28493 | 0.60000 | 0.51468 | 0.54554 | 0.36025 | 3.43672 | 0.00091 | -0.00620 | 1.00000 | 0.385E+00 | 0.101E-01 |
| | 0.1718 | C.2503 | 0.9776 | -0.1746 | -0.1175 | 3.1191 | 0.4362 | 0.7211 | 0.6000 | -0.4585 | | | |
| 62 | 0.60000 | C.50000 | 0.34484 | 0.60000 | 0.54654 | 0.55619 | 0.46125 | 3.38746 | 0.00113 | -0.00284 | 1.00000 | 0.418E+00 | 0.453E-02 |
| | 0.1369 | C.1691 | 0.9724 | -0.1789 | -0.1456 | 3.1028 | 0.4362 | 0.7813 | 0.6000 | -0.4478 | | | |
| 63 | 0.60000 | C.60000 | 0.41234 | 0.60000 | 0.57702 | 0.56920 | 0.56413 | 3.33240 | 0.00390 | -0.00356 | 1.00000 | 0.415E+00 | 0.785E-02 |

0.0485 C.0697 C.9658 -0.1828 -0.1837 3.0924 0.4362 0.8485 0.6000 -0.4375

64 0.60000 C.70000 0.48577 0.60000 0.60298 0.58142 0.67252 3.67387 0.00220-0.00533 1.00000 0.413E+00 0.675E-02
C.0347 C.0496 0.9575 -0.1873 -0.2192 3.0922 0.4362 0.9220 0.6000 -0.429E

65 0.70000 C.0 0.26382 0.70000 0.50243 0.62580 0.00174 3.85366-0.00102 0.00360 1.00000 -0.549E+01 0.122E+01
0.1914 C.2756 0.9754 -0.2018 0.0006 3.1257 0.4362 0.7000 0.7000 -0.4633

66 0.70000 C.10000 0.27092 0.70000 0.50662 0.63197 0.08635 3.84832-0.00218-0.00831 1.00000 0.168E+00 0.535E-01
0.1837 C.2682 0.9787 -0.2030 -0.0303 3.1237 0.4362 0.7071 0.7000 -0.4617

67 0.70000 C.20000 0.29183 0.70000 0.51856 0.63665 0.17597 3.83108-0.00151-0.00420 1.00000 0.367E+00 0.131E-01
0.1656 C.2411 0.9779 -0.2047 -0.0591 3.1168 0.4362 0.7280 0.7000 -0.4575

68 0.70000 C.30000 0.32539 0.70000 0.53667 0.64429 0.27376 3.80364-0.00064-0.00459 1.00000 0.386E+00 0.100E-01
0.1346 C.1952 0.9741 -0.2075 -0.0896 3.1076 0.4362 0.7616 0.7000 -0.4511

69 0.70000 C.40000 0.37004 0.70000 0.55858 0.65362 0.37141 3.76727-0.00047-0.00376 1.00000 0.406E+00 0.609E-02
0.0909 C.1311 0.9699 -0.2111 -0.1211 3.0984 0.4362 0.8062 0.7000 -0.4436

70 0.70000 0.50000 0.42405 0.70000 0.58165 0.66462 0.47212 3.72308 0.00139-0.00297 1.00000 0.418E+00 0.553E-02
0.0355 C.0510 0.9646 -0.2145 -0.1537 3.0917 0.4362 0.8692 0.7000 -0.4360

71 0.70000 C.60000 0.48577 0.70000 0.60298 0.67769 0.57539 3.67386 0.00170-0.00600 1.00000 0.406E+00 0.868E-02
0.0347 C.0496 0.9575 -0.2186 -0.1880 3.0922 0.4362 0.9220 0.7000 -0.429E

72 0.70000 C.70000 0.55376 0.70000 0.61574 0.69011 0.68417 3.61973 0.00094-0.00626 1.00000 0.409E+00 0.719E-02
0.1149 C.1639 0.9492 -0.2222 -0.2226 3.1015 0.4362 0.9895 0.7000 -0.4266

73 0.80000 0.0 0.36382 0.80000 0.55875 0.74449 0.00178 3.77239-0.00250 0.00301 1.00000 -0.692E+01 0.182E+01
0.0970 C.1401 0.9705 -0.2410 0.0004 3.0994 0.4362 0.8000 0.8000 -0.4445

74 0.80000 C.10000 0.37004 0.80000 0.55858 0.74638 0.08588 3.76727-0.00156-0.00592 1.00000 0.251E+00 C.446E-01
0.0909 C.1311 0.9699 -0.2414 -0.0309 3.0984 0.4362 0.8062 0.8000 -0.4436

75 0.80000 C.20000 0.38844 0.80000 0.56687 0.75087 0.18479 3.75199 0.00327-0.00468 1.00000 0.362E+00 C.188E-01
0.0730 C.1052 0.9682 -0.2425 -0.0612 3.0953 0.4362 0.8246 0.8000 -0.440E

76 0.80000 C.30000 0.41822 0.80000 0.57535 0.75769 0.28159 3.72777 0.00085-0.00358 1.00000 0.399E+00 0.103E-01
0.0419 C.0602 0.9652 -0.2448 -0.0922 3.0921 0.4362 0.8544 0.8000 -0.4367

77 0.80000 C.40000 0.45824 0.80000 0.59416 0.76479 0.38054 3.69571 0.00327-0.00387 1.00000 0.406E+00 0.798E-02
0.0028 C.0040 0.9608 -0.2480 -0.1244 3.0910 0.4362 0.8944 0.8000 -0.4322

78 0.80000 C.50000 0.50721 0.80000 0.60509 0.77668 0.48359 3.65609 0.00051-0.00208 1.00000 0.424E+00 C.384E-02
0.0580 C.0828 0.9552 -0.2509 -0.1570 3.0933 0.4362 0.9434 0.8000 -0.4283

79 0.80000 C.60000 0.56381 0.80000 0.62164 0.78978 0.58715 3.61078 0.00225-0.00447 1.00000 0.414E+00 C.824E-02
0.1249 C.1780 0.9483 -0.2538 -0.1907 3.1027 0.4362 1.0000 0.8000 -0.4263

80 0.90000 C.0 0.46382 0.90000 0.59604 0.86261 0.00277 3.69091-0.00040 0.00352 1.00000 -0.969E+01 0.295E+01
0.0093 C.0118 0.9632 -0.2752 0.0004 3.0907 0.4362 0.9000 0.9000 -0.4317

81 0.90000 C.10000 0.46935 0.90000 0.59388 0.86469 0.08890 3.68703-0.00134-0.01019 1.00000 0.131E+00 0.877E-01
0.0160 0.0229 0.9594 -0.2801 -0.0321 3.0914 0.4362 0.9055 0.9000 -0.4312

82 0.90000 C.20000 0.48577 0.90000 0.61297 0.86857 0.18553 3.67387-0.00155-0.00509 1.00000 0.359E+00 0.212E-01
0.0347 C.0496 0.9575 -0.2814 -0.0629 3.0922 0.4362 0.9220 0.9000 -0.4298

83 0.90000 C.30000 0.51250 0.90000 0.61044 0.87494 0.28874 3.65245-0.00144-0.00426 1.00000 0.393E+00 C.113E-01
0.0656 C.0937 0.9544 -0.2832 -0.0947 3.0946 0.4362 0.9487 0.9000 -0.4281

84 0.90000 C.40000 0.54870 0.90000 0.61880 0.88361 0.38924 3.62402-0.00253-0.00536 1.00000 0.396E+00 C.952E-02
0.1094 C.1561 0.9498 -0.2858 -0.1273 3.1006 0.4362 0.9849 0.9000 -0.4267

85-0.10000 C.10000-0.29476-0.10000 0.04001-0.02787 0.02812 4.27035 0.01471-0.00538 1.00000 -0.139E+00 C.787E-02
0.4836 C.7652 0.9999 0.0121 -0.0195 3.5242 0.4362 0.1414 -0.1000 -0.5577

86-0.10000 C.20000-0.21258-0.10000 0.12648-0.05431 0.10961 4.22624 0.00952-0.00668 1.00000 0.238E+00 C.586E-02
0.4583 C.7175 C.9993 0.0185 -0.0337 3.4459 0.4362 0.2236 -0.1000 -0.5792

87-0.10000 C.30000-0.11906-0.10000 0.20713-0.06923 0.24593 4.16185 0.02413-0.00416 1.00000 0.371E+00 C.274E-02

```
    0.4252  0.6571  0.9978  0.0215 -0.0624  3.3640  0.4362  0.3162 -0.1000 -0.5573

88-0.10000 0.40000-0.02387-0.10000 0.29184-0.07596 0.39760 4.08773 0.00428-0.00029 1.00000  0.433E+00 0.420E-02
    0.3833  0.5841  0.9953  0.0244 -0.0937  3.2874  0.4362  0.4123 -0.1000 -0.5335

89-0.10000 0.50000 0.37372-0.10000 0.37143-0.08115 0.41255 4.00520 0.00435 0.00051 1.00000  0.440E+00 0.446E-02
    0.3302  0.4959  0.9914  0.0266 -0.1280  3.2299  0.4362  0.5095 -0.1000 -0.5085

90-0.10000 0.60000 0.17209-0.10000 0.44359-0.08512 0.52055 3.92863 0.00430 0.00109 1.00000  0.443E+00 0.418E-02
    0.2652  0.3924  0.9860  0.0282 -0.1642  3.1644  0.4362  0.6083 -0.1000 -0.4842

91-0.10000 0.70000 0.27092-0.10000 0.51663-0.08810 0.63173 3.84831 0.00476-0.00266 1.00000  0.423E+00 0.437E-02
    0.1837  0.2682  0.9787  0.0297 -0.2021  3.1237  0.4362  0.7071 -0.1000 -0.4617

92-0.10000 0.80000 0.37004-0.10000 0.55858-0.09104 0.74624 3.76727 0.00398-0.00179 1.00000  0.429E+00 0.375E-02
    0.0909  0.1311  0.9699  0.0307 -0.2414  3.0984  0.4362  0.8062 -0.1000 -0.4436

93-0.10000 0.90000 0.46935-0.10000 0.59788-0.09367 0.86419 3.68702 0.00351-0.00202 1.00000  0.425E+00 0.328E-02
    0.0159  0.0228  0.9594  0.0314 -0.2832  3.0914  0.4362  0.9055 -0.1000 -0.4312

94-0.20000 0.0     -0.23618-0.20000 0.09770-0.09844 0.00036 4.24076 0.01524 0.00549 1.00000 -0.327E+01-0.106E+00
    0.4646  0.7293  0.9995  0.0329  0.0015  3.4683  0.4362  0.2000 -0.2000 -0.5835

95-0.20000 0.10000-0.21258-0.20000 0.12046-0.10921 0.05509 4.22611 0.00813 0.00150 1.00000  0.559E+00 0.123E-01
    0.4598  0.7201  0.9993  0.0341 -0.0154  3.4458  0.4362  0.2236 -0.2000 -0.5795

96-0.20000 0.20000-0.15334-0.20000 0.17644-0.12891 0.12939 4.18596 0.00414-0.00020 1.00000  0.431E+00 0.353E-02
    0.4394  0.6826  0.9985  0.0352 -0.0382  3.3925  0.4362  0.2828 -0.2000 -0.5661

97-0.20000 0.30000-0.07563-0.20000 0.24692-0.14513 0.21908 4.12814 0.00441 0.00101 1.00000  0.452E+00 0.510E-02
    0.4076  0.6261  0.9968  0.0449 -0.0655  3.3274  0.4362  0.3606 -0.2000 -0.5467

98-0.20000 0.40000 0.01103-0.20000 0.32110-0.15752 0.31662 4.06009 0.00370-0.00112 1.00000  0.425E+00 0.313E-02
    0.3646  0.5527  0.9940  0.0494 -0.0974  3.2622  0.4362  0.4472 -0.2000 -0.5242

99-0.20000 0.50000 0.10233-0.20000 0.39328-0.16597 0.41573 3.98578 0.00517 0.00243 1.00000  0.455E+00 0.617E-02
    0.3128  0.4677  0.9900  0.0534 -0.1303  3.2024  0.4362  0.5385 -0.2000 -0.5014

100-0.20000 0.60000 0.19627-0.20000 0.45595-0.17359 0.52630 3.90911 0.00442-0.00003 1.00000  0.436E+00 0.441E-02
    0.2460  0.3628  0.9844  0.0565 -0.1669  3.1532  0.4362  0.6325 -0.2000 -0.4783

101-0.20000 0.70000 0.25183-0.20000 0.51857-0.17956 0.63677 3.83108 0.00495-0.00128 1.00000  0.430E+00 0.462E-02
    0.1656  0.2411  0.9770  0.0592 -0.2047  3.1168  0.4362  0.7280 -0.2000 -0.4575

102-0.20000 0.80000 0.30844-0.20000 0.56688-0.18473 0.75089 3.75199 0.00477 0.00030 1.00000  0.437E+00 0.484E-02
    0.0730  0.1052  0.9682  0.0612 -0.2425  3.0953  0.4362  0.8246 -0.2000 -0.4408

103-0.20000 0.90000 0.48577-0.20000 0.60297-0.19032 0.86846 3.67387 0.00441-0.00169 1.00000  0.430E+00 0.403E-02
    0.0347  0.0496  0.9575  0.0629 -0.2814  3.0922  0.4362  0.9220 -0.2000 -0.4298

104-0.30000 0.0     -0.13618-0.30000 0.19220-0.20024 0.00097 4.17358 0.00301 0.00707 1.00000 -0.347E+01-0.232E+00
    0.4326  0.6704  0.9982  0.0602  0.0018  3.3776  0.4362  0.3000 -0.3000 -0.5618

105-0.30000 0.10000-0.11596-0.30000 0.20713-0.20566 0.06902 4.16185 0.00582 0.00116 1.00000  0.494E+00 0.945E-02
    0.4252  0.6571  0.9978  0.0629 -0.0202  3.3640  0.4362  0.3162 -0.3000 -0.5573

106-0.30000 0.20000-0.07563-0.30000 0.24692-0.21915 0.14653 4.12814 0.00410 0.00326 1.00000  0.512E+00 0.916E-02
    0.4076  0.6261  0.9968  0.0668 -0.0431  3.3274  0.4362  0.3606 -0.3000 -0.5467

107-0.30000 0.30000-0.01192-0.30000 0.33138-0.23202 0.23383 4.07840 0.00588 0.00190 1.00000  0.463E+00 0.782E-02
    0.3765  0.5727  0.9943  0.0726 -0.0707  3.2787  0.4362  0.4243 -0.3000 -0.5301

108-0.30000 0.40000 0.06382-0.30000 0.36367-0.24479 0.32871 4.01757 0.00555 0.00045 1.00000  0.441E+00 0.585E-02
    0.3347  0.5033  0.9918  0.0776 -0.1017  3.2267  0.4362  0.5000 -0.3000 -0.5107

109-0.30000 0.50000 0.14691-0.30000 0.42596-0.25612 0.42521 3.94569 0.00385-0.00017 1.00000  0.435E+00 0.379E-02
    0.2816  0.4183  0.9874  0.0818 -0.1351  3.1778  0.4362  0.5831 -0.3000 -0.4900

110-0.30000 0.60000 0.23464-0.30000 0.48472-0.26696 0.53392 3.87799 0.00147-0.00280 1.00000  0.420E+00-0.119E-05
    0.2146  0.3147  0.9815  0.0855 -0.1711  3.1379  0.4362  0.6708 -0.3000 -0.4654

111-0.30000 0.70000 0.32539-0.30000 0.53668-0.27310  .64457 3.80363 0.00575-0.00013 1.00000  0.436E+00 0.573E-02
```

```
     0.1346  0.1952  0.9741  0.0857 -0.2078  3.1074  0.4362  0.7616 -0.3000 -0.4511

112-0.30000 0.80000 0.41822-0.30000 0.57540-0.28137 0.75777 3.72776 0.00392 0.00098 1.00000  0.440E+00 0.429E-02
     0.0419  0.0602  0.9652  0.0923 -0.2448  3.0921  0.4362  0.8544 -0.3000 -0.4367

113-0.30000 0.90000 0.51250-0.30000 0.61044-0.28865 0.87497 3.65245 0.00439-0.00141 1.00000  0.431E+00 0.351E-02
     0.0656  0.0937  0.9544  0.0947 -0.2832  3.0946  0.4362  0.9487 -0.3000 -0.4281

114-0.40000 0.0     -0.03618-0.40000 0.28135-0.30392 0.00091 4.09772 0.00462 0.00428 1.00000 -0.374E+01-0.388E+00
     0.3878  0.5919  0.9956  0.0936  0.0919  3.2969  0.4362  0.4000 -0.4000 -0.5361

115-0.40000 0.10000-0.02387-0.40000 0.29185-0.30699 0.07843 4.08773 0.00307 0.00679 1.00000  0.146E+00 0.324E-01
     0.3833  0.5841  0.9953  0.0943 -0.0218  3.2874  0.4362  0.4123 -0.4000 -0.5335

116-0.40000 0.20000 0.01103-0.40000 0.32110-0.31597 0.15883 4.06009 0.00372 0.00150 1.00000  0.467E+00 0.678E-02
     0.3645  0.5527  0.9940  0.0980 -0.0482  3.2622  0.4362  0.4472 -0.4000 -0.5242

117-0.40000 0.30000 0.06382-0.40000 0.36367-0.32695 0.24713 4.01758 0.00548 0.00234 1.00000  0.467E+00 0.866E-02
     0.3347  0.5033  0.9918  0.1030 -0.0759  3.2267  0.4362  0.5000 -0.4000 -0.5107

118-0.40000 0.40000 0.12550-0.40000 0.41340-0.33806 0.34119 3.96364 0.00332 0.01307 1.00000  0.464E+00 0.636E-02
     0.2947  0.4388  0.9885  0.1074 -0.1061  3.1869  0.4362  0.5657 -0.4000 -0.4945

119-0.40000 0.50000 0.20413-0.40000 0.46516-0.35013 0.44084 3.90272 0.00485 0.00166 1.00000  0.448E+00 0.623E-02
     0.2398  0.3531  0.9838  0.1127 -0.1354  3.1497  0.4362  0.6403 -0.4000 -0.4764

120-0.40000 0.60000 0.28493-0.40000 0.51468-0.36052 0.54535 3.83673 0.00566 0.00055 1.00000  0.435E+00 0.603E-02
     0.1718  0.2503  0.9776  0.1174 -0.1747  3.1100  0.4362  0.7211 -0.4000 -0.4589

121-0.40000 0.70000 0.37004-0.40000 0.55859-0.37053 0.65412 3.76727 0.00524 0.00038 1.00000  0.438E+00 0.545E-02
     0.0909  0.1311  0.9699  0.1213 -0.2110  3.0984  0.4362  0.8062 -0.4000 -0.4436

122-0.40000 0.80000 0.45824-0.40000 0.59417-0.37993 0.76709 3.69571 0.00475 0.00070 1.00000  0.439E+00 0.510E-02
     0.0030  0.0043  0.9608  0.1245 -0.2479  3.0910  0.4362  0.8934 -0.4000 -0.4322

123-0.40000 0.90000 0.54870-0.40000 0.61881-0.38871 0.88384 3.62402 0.00601-0.00224 1.00000  0.429E+00 0.501E-02
     0.1094  0.1561  0.9498  0.1273 -0.2858  3.1006  0.4362  0.9849 -0.4000 -0.4267

124-0.50000 0.0     -0.06382-0.50000 0.36367-0.40384 0.00169 4.01756 0.00390 0.00571 1.00000 -0.411E+01-0.584E+00
     0.3347  0.5033  0.9919  0.1279  0.0112  3.2266  0.4362  0.5000 -0.5000 -0.5107

125-0.50000 0.10000 0.07372-0.50000 0.37144-0.41184 0.08470 4.00919 0.00183 0.00730 1.00000  0.737E+00 0.409E-01
     0.3302  0.4959  0.9914  0.1285 -0.0240  3.2200  0.4362  0.5096 -0.5003 -0.5085

126-0.50000 0.20000 0.10233-0.50000 0.39327-0.41858 0.16873 3.98578 0.00104 0.00351 1.00000  0.504E+00 0.997E-02
     0.3128  0.4677  0.9903  0.1310 -0.0516  3.2025  0.4362  0.5385 -0.5000 -0.5014

127-0.50000 0.30000 0.14691-0.50000 0.42596-0.42772 0.25858 3.94969 0.00417 0.00275 1.00000  0.470E+00 0.881E-02
     0.2816  0.4183  0.9874  0.1359 -0.0805  3.1778  0.4362  0.5831 -0.5000 -0.4909

128-0.50000 0.40000 0.20413-0.50000 0.46517-0.43823 0.35329 3.90273 0.00445 0.00279 1.00000  0.461E+00 0.801E-02
     0.2398  0.3531  0.9838  0.1406 -0.1113  3.1497  0.4362  0.6403 -0.5000 -0.4764

129-0.50000 0.50000 0.27092-0.50000 0.53663-0.44910 0.45294 3.84831 0.00624 0.00157 1.00000  0.447E+00 0.782E-02
     0.1837  0.2682  0.9787  0.1458 -0.1445  3.1237  0.4362  0.7071 -0.5000 -0.4617

130-0.50000 0.60000 0.34484-0.50000 0.54655-0.46312 0.55711 3.78745 0.00501 0.00293 1.00000  0.452E+00 0.747E-02
     0.1169  0.1691  0.9724  0.1459 -0.1786  3.1028  0.4362  0.7810 -0.5000 -0.4478

131-0.50000 0.70000 0.42405-0.50000 0.58166-0.47081 0.66555 3.72307 0.00495 0.00280 1.00000  0.449E+00 0.696E-02
     0.0355  0.0510  0.9646  0.1539 -0.2144  3.0917  0.4362  0.8602 -0.5000 -0.4369

132-0.50000 0.80000 0.53721-0.50000 0.60510-0.48217 0.77763 3.65615 0.00419 0.00175 1.00000  0.443E+00 0.518E-02
     0.0580  0.0829  0.9552  0.1572 -0.2508  3.0933  0.4362  0.9434 -0.5000 -0.4283

133-0.60000 0.0     0.16302-0.60000 0.43782-0.51836 0.00217 3.93574 0.00166 0.00562 1.00000 -0.466E+01-0.845E+00
     0.2700  0.3999  0.9864  0.1641 -0.0911  3.1699  0.4362  0.6000 -0.6000 -0.4860

134-0.60000 0.10000 0.17219-0.60000 0.44361-0.52028 0.08674 3.92863-0.00141 0.00013 1.00000  0.441E+00 0.359E-03
     0.2652  0.3924  0.9860  0.1643 -0.1274  3.1644  0.4362  0.6083 -0.6000 -0.4842

135-0.60000 0.20000 0.19627-0.60000 0.45595-0.52407 0.17787 3.90511 0.00344 0.00582 1.00000  0.541E+00 0.213E-01
```

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.2460 | C.3628 | C.9844 | C.1676 | -0.0546 | 3.1532 | 0.4362 | 0.6325 | -0.6000 | -0.4783 | | | |
| 136- | -0.60000 | C.30000 | 0.23464- | 0.60000 | 0.48472- | 0.53393 | 0.26695 | 3.87799 | 0.00280 | -0.00142 | 1.00000 | 0.420E+00 | -C.341E-04 |
| | 0.2146 | C.3147 | C.9815 | 0.1711 | -0.0856 | 3.1370 | 0.4362 | 0.6718 | -0.6000 | -0.4694 | | | |
| 137- | -0.60000 | C.40000 | 0.28493- | 0.60000 | 0.51468- | 0.54236 | 0.36502 | 3.83672 | 0.00538 | 0.00323 | 1.00000 | 0.463E+00 | C.103E-01 |
| | 0.1718 | C.2503 | C.9776 | 0.1756 | -0.1160 | 3.1140 | 0.4362 | 0.7211 | -0.6000 | -0.4589 | | | |
| 138- | -0.60000 | C.50000 | 0.34484- | 0.60000 | 0.54654- | 0.55397 | 0.46379 | 3.78746 | 0.00255 | 0.00162 | 1.00000 | 0.447E+00 | C.454E-02 |
| | 0.1169 | C.1691 | C.9724 | 0.1754 | -0.1490 | 3.1028 | 0.4362 | 0.7810 | -0.6000 | -0.4478 | | | |
| 139- | -0.60000 | C.60000 | 0.41234- | 0.60000 | 0.57702- | 0.56413 | 0.56920 | 3.73240 | 0.00396 | 0.00350 | 1.00000 | 0.457E+00 | C.788E-02 |
| | 0.0485 | C.0697 | C.9659 | 0.1837 | -0.1828 | 3.0924 | 0.4362 | 0.8485 | -0.6000 | -0.4375 | | | |
| 140- | -0.60000 | C.70000 | 0.48577- | 0.60000 | 0.60298- | 0.57568 | 0.67744 | 3.67387 | 0.00561 | 0.00176 | 1.00000 | 0.442E+00 | C.678E-02 |
| | 0.0347 | C.0496 | C.9575 | 0.1880 | -0.2186 | 3.0922 | 0.4362 | 0.9220 | -0.6000 | -0.4298 | | | |
| 141- | -0.70000 | C.0 | 0.26382- | 0.70000 | 0.57243- | 0.62080 | 0.00174 | 3.85366 | 0.00103 | 0.00360 | 1.00000 | -0.549E+01 | -C.122E+01 |
| | 0.1914 | C.2796 | C.9794 | 0.2018 | -0.0906 | 3.1257 | 0.4362 | 0.7000 | -0.7000 | -0.4633 | | | |
| 142- | -0.70000 | C.10000 | 0.27092- | 0.70000 | 0.59662- | 0.63089 | 0.09393 | 3.84832 | 0.00438 | 0.00711 | 1.00000 | 0.687E+00 | C.564E-01 |
| | 0.1837 | C.2682 | C.9787 | 0.2034 | -0.0978 | 3.1237 | 0.4362 | 0.7071 | -0.7000 | -0.4617 | | | |
| 143- | -0.70000 | C.20000 | 0.29183- | 0.70000 | 0.51856- | 0.63563 | 0.18354 | 3.83108 | 0.00350 | 0.00276 | 1.00000 | 0.483E+00 | C.133E-01 |
| | 0.1656 | C.2411 | C.9773 | 0.2051 | -0.0580 | 3.1168 | 0.4362 | 0.7280 | -0.7000 | -0.4575 | | | |
| 144- | -0.70000 | C.30000 | 0.32539- | 0.70000 | 0.53667- | 0.64258 | 0.27776 | 3.80364 | 0.00376 | 0.00270 | 1.00000 | 0.466E+00 | C.101E-01 |
| | 0.1346 | C.1952 | C.9741 | 0.2080 | -0.0885 | 3.1176 | 0.4362 | 0.7616 | -0.7000 | -0.4511 | | | |
| 145- | -0.70000 | C.40000 | C.37004- | 0.70000 | 0.55858- | 0.65182 | 0.37456 | 3.76727 | 0.00348 | 0.00151 | 1.00000 | 0.448E+00 | C.612E-02 |
| | C.0909 | C.1311 | C.9659 | 0.2115 | -0.1204 | 3.0984 | 0.4362 | 0.8062 | -0.7000 | -0.4436 | | | |
| 146- | -0.70000 | C.50000 | 0.42405- | 0.70000 | 0.58165- | 0.66215 | 0.47557 | 3.72308 | 0.00236 | 0.00227 | 1.00000 | 0.451E+00 | C.555E-02 |
| | 0.0355 | C.0510 | C.9646 | 0.2149 | -0.1531 | 3.0917 | 0.4362 | 0.8602 | -0.7000 | -0.4360 | | | |
| 147- | -0.70000 | C.60000 | 0.48577- | 0.70000 | 0.60298- | 0.67227 | 0.58172 | 3.67387 | 0.00567 | 0.00260 | 1.00000 | 0.449E+00 | C.872E-02 |
| | 0.0347 | C.0496 | C.9575 | 0.2192 | -0.1873 | 3.0922 | 0.4362 | 0.9220 | -0.7000 | -0.4298 | | | |
| 148- | -0.70000 | C.70000 | 0.55376- | 0.70000 | 0.61974- | 0.68417 | 0.69011 | 3.61977 | 0.00626 | 0.00054 | 1.00000 | 0.440E+00 | C.720E-02 |
| | 0.0349 | C.0539 | C.9492 | 0.2226 | -0.2222 | 3.1015 | 0.4362 | 0.9896 | -0.7000 | -0.4266 | | | |
| 149- | -0.80000 | C.0 | 0.36382- | 0.80000 | 0.55575- | 0.76449 | 0.00178 | 3.77239 | 0.00250 | 0.00301 | 1.00000 | -0.692E+01 | -C.182E+01 |
| | C.0970 | C.1401 | C.9705 | 0.2410 | -0.0304 | 3.0994 | 0.4362 | 0.8030 | -0.8000 | -0.4445 | | | |
| 150- | -0.80000 | C.10000 | 0.37004- | 0.80000 | 0.55858- | 0.74555 | 0.09654 | 3.76727 | 0.00295 | 0.00523 | 1.00000 | 0.608E+00 | C.458E-01 |
| | 0.0909 | C.1311 | C.9659 | 0.2416 | -0.0255 | 3.0984 | 0.4362 | 0.8062 | -0.8000 | -0.4436 | | | |
| 151- | -0.80000 | C.20000 | 0.38844- | 0.80000 | 0.56687- | 0.74959 | 0.19039 | 3.75199 | 0.00196 | 0.00425 | 1.00000 | 0.505E+00 | 0.191E-01 |
| | 0.0730 | C.1052 | C.9682 | 0.2428 | -0.0601 | 3.0953 | 0.4362 | 0.8246 | -0.8000 | -0.4408 | | | |
| 152- | -0.80000 | C.30000 | 0.41822- | 0.80000 | 0.57939- | 0.75612 | 0.28604 | 3.72777 | 0.00171 | 0.00324 | 1.00000 | 0.470E+00 | C.104E-01 |
| | 0.0419 | 0.0602 | C.9652 | C.2451 | -0.0915 | 3.0921 | 0.4362 | 0.8544 | -0.8000 | -0.4367 | | | |
| 153- | -0.80000 | 0.40000 | 0.45824- | 0.80000 | 0.59416- | 0.76445 | 0.38503 | 3.69571 | 0.00293 | 0.00253 | 1.00000 | 0.456E+00 | 0.802E-02 |
| | 0.0028 | C.0040 | C.9608 | 0.2483 | -0.1237 | 3.0911 | 0.4362 | 0.8944 | -0.8000 | -0.4322 | | | |
| 154- | -0.80000 | C.50000 | 0.50721- | 0.80000 | 0.60599- | 0.77533 | 0.48623 | 3.65609 | 0.00165 | 0.00137 | 1.00000 | 0.445E+00 | 0.385E-02 |
| | 0.0580 | C.0828 | C.9552 | 0.2511 | -0.1567 | 3.0933 | 0.4362 | 0.9434 | -0.8000 | -0.4283 | | | |
| 155- | -0.80000 | C.60000 | 0.56391- | 0.80000 | 0.62164- | 0.78481 | 0.59378 | 3.61078 | 0.00365 | 0.00345 | 1.00000 | 0.453E+00 | C.876E-02 |
| | 0.1248 | C.1780 | C.9483 | 0.2541 | -0.1903 | 3.1027 | 0.4362 | 1.0000 | -0.8000 | -0.4263 | | | |
| 156- | -0.80000 | C.0 | 0.46382- | 0.90000 | 0.59604- | 0.86261 | 0.00277 | 3.69091 | 0.00340 | 0.00392 | 1.00000 | -0.969E+01 | -0.295E+01 |
| | 0.0083 | C.0118 | C.9802 | 0.2792 | -0.1304 | 3.0907 | 0.4362 | 3.9010 | -0.9000 | -0.4317 | | | |
| 157- | -0.90000 | C.10000 | 0.46935- | 0.90000 | 0.59788- | 0.86317 | 0.10265 | 3.68703 | 0.00347 | 0.00905 | 1.00000 | 0.723E+00 | C.872E-01 |
| | 0.0160 | C.0229 | C.9554 | 0.2803 | -0.1303 | 3.0914 | 0.4362 | 0.9055 | -0.9000 | -0.4312 | | | |
| 158- | -0.90000 | C.20000 | 0.48577- | 0.90000 | 0.60297- | 0.86710 | 0.19615 | 3.67387 | 0.00355 | 0.00351 | 1.00000 | 0.496E+00 | C.213E-01 |
| | 0.0347 | 0.0496 | C.9575 | 0.2816 | -0.0622 | 3.0922 | 0.4362 | 0.9220 | -0.9000 | -0.4298 | | | |
| 159- | -0.90000 | C.30000 | C.51250- | 0.90000 | 0.61044- | 0.87320 | 0.29398 | 3.65245 | 0.00371 | 0.00255 | 1.00000 | 0.462E+00 | C.114E-01 |

0.0656 0.0937 0.9544 0.2834 -0.0942 3.0946 0.4362 0.9487 -0.9000 -0.4281

160-0.50000 0.40000 0.54870-0.90000 0.61880-0.88103 0.39504 3.62402 0.00567 0.00172 1.00000 0.449E+00 0.955E-02
0.1094 0.1561 0.9458 0.2860 -0.1269 3.1006 0.4362 0.9849 -0.9000 -0.4267

IMIRROR IMAGE SKEW RAYS FOLLOW

| IMAGE RAY | RAY | RAYY | RAYZ | OPL | YIM | ZIP | NTNCTY | XDIAPT YDIAPT |
|---|---|---|---|---|---|---|---|---|
| 161 | 1 | 0.0 | -0.2000000 | 4.24078274 | 0.0054853 | 0.0164587 | 1.0000000 | -0.603E-01 0.475E-02 |
| 162 | 2 | 0.0 | -0.3000001 | 4.17357540 | 0.0031923 | 0.0031132 | 1.0000000 | 0.395E+00 0.315E-02 |
| 163 | 3 | 0.0 | -0.4000001 | 4.09772682 | 0.0028030 | 0.0046203 | 1.0000000 | 0.387E+00 0.277E-02 |
| 164 | 4 | 0.0 | -0.5000001 | 4.01756477 | 0.0039502 | 0.0029974 | 1.0000000 | 0.413E+00 0.393E-02 |
| 165 | 5 | 0.0 | -0.6000001 | 3.93575191 | 0.0043350 | 0.0016529 | 1.0000000 | 0.426E+00 0.433E-02 |
| 166 | 6 | 0.0 | -0.7000002 | 3.85365105 | 0.0044867 | 0.0010263 | 1.0000000 | 0.431E+00 0.448E-02 |
| 167 | 7 | 0.0 | -0.8000002 | 3.77238750 | 0.0036257 | 0.0024981 | 1.0000000 | 0.426E+00 0.362E-02 |
| 168 | 8 | 0.0 | -0.9000002 | 3.69091415 | 0.0039220 | 0.0003997 | 1.0000000 | 0.435E+00 0.392E-02 |
| 169 | 9 | 0.10C0000 | -0.1000000 | 4.27035427 | -0.0053825 | 0.0147110 | 1.0000000 | -0.781E+00 0.619E-02 |
| 170 | 10 | 0.10C0000 | -0.2000000 | 4.22624493 | 0.0003680 | 0.0116265 | 1.0000000 | 0.105E+00 0.564E-02 |
| 171 | 11 | 0.10C0000 | -0.3000001 | 4.16185284 | 0.0008731 | 0.0057240 | 1.0000000 | 0.345E+00 0.272E-02 |
| 172 | 12 | 0.10C0000 | -0.4000001 | 4.08772659 | 0.0036370 | 0.0022712 | 1.0000000 | 0.412E+00 0.418E-02 |
| 173 | 13 | 0.10C0000 | -0.5000001 | 4.00919724 | 0.0042109 | 0.0012001 | 1.0000000 | 0.427E+00 0.444E-02 |
| 174 | 14 | 0.10C0000 | -0.6000001 | 3.92863178 | 0.0041304 | 0.0002688 | 1.0000000 | 0.435E+00 0.417E-02 |
| 175 | 15 | 0.10C0000 | -0.7000002 | 3.84831238 | 0.0038219 | 0.0038793 | 1.0000000 | 0.418E+00 0.436E-02 |
| 176 | 16 | 0.10C0000 | -0.8000002 | 3.76727295 | 0.0034146 | 0.0027167 | 1.0000000 | 0.425E+00 0.375E-02 |
| 177 | 17 | 0.10C0000 | -0.9000002 | 3.68702126 | 0.0029792 | 0.0023367 | 1.0000000 | 0.427E+00 0.378E-02 |
| 178 | 18 | 0.20C0000 | -0.1000000 | 4.22610664 | -0.0133557 | 0.0076477 | 1.0000000 | 0.112E-01 0.106E-01 |
| 179 | 20 | 0.20C0000 | -0.2000000 | 4.18595886 | -0.0102034 | 0.0041443 | 1.0000000 | 0.331E+00 0.483E-02 |
| 180 | 21 | 0.20C0000 | -0.3000001 | 4.12814045 | -0.0126273 | 0.0036802 | 1.0000000 | 0.381E+00 0.501E-02 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 181 | 22 | 0.2000000-0.4000001 | 4.06009197 | 0.0013279 | 0.0036302 | 1.0000000 | 0.399E+00<br>0.312E-02 |
| 182 | 23 | 0.2000000-0.5000001 | 3.98577595 | 0.0054189 | 0.0018111 | 1.0000000 | 0.423E+00<br>0.613E-02 |
| 183 | 24 | 0.2000000-0.6000001 | 3.90910721 | 0.0035214 | 0.0026788 | 1.0000000 | 0.420E+00<br>0.440E-02 |
| 184 | 25 | 0.2000000-0.7000002 | 3.83107567 | 0.0035610 | 0.0037240 | 1.0000000 | 0.418E+00<br>0.461E-02 |
| 185 | 26 | 0.2000000-0.8000002 | 3.75158841 | 0.0043493 | 0.0015773 | 1.0000000 | 0.428E+00<br>0.484E-02 |
| 186 | 27 | 0.2000000-0.9000002 | 3.67387295 | 0.0032785 | 0.0034030 | 1.0000000 | 0.425E+00<br>0.403E-02 |
| 187 | 28 | 0.3000001-0.1000000 | 4.16185093 | -0.0039618 | 0.0044041 | 1.0000000 | 0.233E+00<br>0.877E-02 |
| 188 | 30 | 0.3000001-0.2000000 | 4.12813854 | 0.0014287 | 0.0050400 | 1.0000000 | 0.325E+00<br>0.874E-02 |
| 189 | 31 | 0.3000001-0.3000001 | 4.07840347 | 0.0018931 | 0.0058762 | 1.0000000 | 0.356E+00<br>0.763E-02 |
| 190 | 32 | 0.3000001-0.4000001 | 4.01757240 | 0.0019837 | 0.0052012 | 1.0000000 | 0.386E+00<br>0.582E-02 |
| 191 | 33 | 0.3000001-0.5000001 | 3.94968891 | 0.0016769 | 0.0035137 | 1.0000000 | 0.411E+00<br>0.377E-02 |
| 192 | 34 | 0.3000001-0.6000001 | 3.87759168 | -0.0014308 | 0.0028040 | 1.0000000 | 0.420E+00<br>0.119E-05 |
| 193 | 35 | 0.3000001-0.7000002 | 3.80363274 | 0.0038987 | 0.0042735 | 1.0000000 | 0.416E+00<br>0.572E-02 |
| 194 | 36 | 0.3000001-0.8000002 | 3.72776127 | 0.0035962 | 0.0018350 | 1.0000000 | 0.429E+00<br>0.428E-02 |
| 195 | 37 | 0.3000001-0.9000002 | 3.65244675 | 0.0026599 | 0.0037535 | 1.0000000 | 0.424E+00<br>0.391E-02 |
| 196 | 39 | 0.4000001-0.1000000 | 4.08772755 | 0.0105001 | 0.0074829 | 1.0000000 | 0.140E+00<br>0.283E-01 |
| 197 | 40 | 0.4000001-0.2000000 | 4.06006530 | -0.0110338 | 0.0038719 | 1.0000000 | 0.358E+00<br>0.659E-02 |
| 198 | 41 | 0.4000001-0.3000001 | 4.01757717 | 0.0107155 | 0.0059121 | 1.0000000 | 0.361E+00<br>0.846E-02 |
| 199 | 42 | 0.4000001-0.4000001 | 3.96364498 | 0.0030038 | 0.0033162 | 1.0000000 | 0.406E+00<br>0.628E-02 |
| 200 | 43 | 0.4000001-0.5000001 | 3.90272331 | 0.0026956 | 0.0044063 | 1.0000000 | 0.405E+00<br>0.618E-02 |
| 201 | 44 | 0.4000001-0.6000001 | 3.83672819 | 0.0026858 | 0.0050118 | 1.0000000 | 0.408E+00<br>0.600E-02 |
| 202 | 45 | 0.4000001-0.7000002 | 3.76726542 | 0.0029799 | 0.0043193 | 1.0000000 | 0.416E+00<br>0.543E-02 |
| 203 | 46 | 0.4000001-0.8000002 | 3.69570827 | 0.0034177 | 0.0033785 | 1.0000000 | 0.423E+00<br>0.509E-02 |
| 204 | 47 | 0.4000001-0.9000002 | 3.62401772 | 0.0123645 | 0.0059649 | 1.0000000 | 0.416E+00<br>0.501E-02 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 205 | 49 | 0.50C0001-0.1000000 | 4.00919342 | 0.0011327 | 0.0075034 | 1.0000000 | 0.163E+00<br>0.363E-01 |
| 206 | 50 | 0.50C0001-0.2000000 | 3.98578453 | 0.0016674 | 0.0032668 | 1.0000000 | 0.375E+00<br>0.971E-02 |
| 207 | 51 | 0.50C0001-0.3000001 | 3.94968987 | 0.0004574 | 0.0049669 | 1.0000000 | 0.376E+00<br>0.863E-02 |
| 208 | 52 | 0.50C0001-0.4000001 | 3.90272522 | 0.0017331 | 0.0049861 | 1.0000000 | 0.393E+00<br>0.790E-02 |
| 209 | 53 | 0.50C0001-0.5000001 | 3.84830856 | 0.0015668 | 0.0062363 | 1.0000000 | 0.354E+00<br>0.775E-02 |
| 210 | 54 | 0.50C0001-0.6000001 | 3.78745365 | 0.0037896 | 0.0043965 | 1.0000000 | 0.412E+00<br>0.743E-02 |
| 211 | 55 | 0.50C0001-0.7000002 | 3.72307014 | 0.0042595 | 0.0037777 | 1.0000000 | 0.419E+00<br>0.694E-02 |
| 212 | 56 | 0.50C0001-0.8000002 | 3.65608788 | 0.0033600 | 0.0029077 | 1.0000000 | 0.425E+00<br>0.517E-02 |
| 213 | 58 | 0.60C0001-0.1000000 | 3.92862511 | 0.0004095 | -0.0001280 | 1.0000000 | 0.441E+00<br>-0.359E-03 |
| 214 | 59 | 0.60C0001-0.2000000 | 3.90910721 | 0.0007309 | 0.0067502 | 1.0000000 | 0.319E+00<br>0.205E-01 |
| 215 | 60 | 0.6000001-0.3000001 | 3.87799454 | -0.0028021 | 0.0014182 | 1.0000000 | 0.429E+00<br>0.341E-04 |
| 216 | 61 | 0.60C0001-0.4000001 | 3.83672237 | 0.0009093 | 0.0062014 | 1.0000000 | 0.385E+00<br>0.101E-01 |
| 217 | 62 | 0.60C0001-0.5000001 | 3.78746128 | 0.0011321 | 0.0028399 | 1.0000000 | 0.418E+00<br>0.453E-02 |
| 218 | 63 | 0.60C0001-0.6000001 | 3.73239708 | 0.0039017 | 0.0035634 | 1.0000000 | 0.415E+00<br>0.785E-02 |
| 219 | 64 | 0.60C0001-0.7000002 | 3.67356723 | 0.0022002 | 0.0053794 | 1.0000000 | 0.413E+00<br>0.675E-02 |
| 220 | 66 | 0.70C0002-0.1000000 | 3.84832956 | -0.0021794 | 0.0083067 | 1.0000000 | 0.168E+00<br>0.535E-01 |
| 221 | 67 | 0.70C0002-0.2000000 | 3.83107758 | -0.0015110 | 0.0042030 | 1.0000000 | 0.367E+00<br>0.131E-01 |
| 222 | 68 | 0.70C0002-0.3000001 | 3.80363560 | -0.0006354 | 0.0045882 | 1.0000000 | 0.386E+00<br>0.100E-01 |
| 223 | 69 | 0.70C0002-0.4000001 | 3.76727200 | -0.0004658 | 0.0037591 | 1.0000000 | 0.406E+00<br>0.669E-02 |
| 224 | 70 | 0.70C0002-0.5000001 | 3.72307587 | 0.0013972 | 0.0029685 | 1.0000000 | 0.418E+00<br>0.553E-02 |
| 225 | 71 | 0.70C0002-0.6000001 | 3.67386246 | 0.0017003 | 0.0060047 | 1.0000000 | 0.406E+00<br>0.868E-02 |
| 226 | 72 | 0.70C0002-0.7000002 | 3.61972523 | 0.0009379 | 0.0062600 | 1.0000000 | 0.409E+00<br>0.719E-02 |
| 227 | 74 | 0.80C0002-0.1000000 | 3.76727200 | -0.0015622 | 0.0055179 | 1.0000000 | 0.251E+00<br>0.446E-01 |
| 228 | 75 | 0.80C0002-0.2000000 | 3.75155127 | 0.0002749 | 0.0046778 | 1.0000000 | 0.362E+00<br>0.188E-01 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 229 | 7E 0.8CC0002-0.3000001 | 3.72776508 | 0.0008479 | 0.0035773 | 1.0000000 | 0.399E+00<br>0.103E-01 |
| 230 | 7F 0.8CC0002-0.4000001 | 3.69571318 | 0.0002673 | 0.0038715 | 1.0000000 | 0.406E+00<br>0.798E-02 |
| 231 | 7E 0.8CC0CD2-0.5000001 | 3.65608978 | 0.0005394 | 0.0020849 | 1.0000000 | 0.424E+00<br>0.384E-02 |
| 232 | 7F 0.8CC0002-0.6000001 | 3.61078167 | 0.0022855 | 0.0044706 | 1.0000000 | 0.414E+00<br>0.824E-02 |
| 233 | E1 0.9CC0002-0.1000000 | 3.68702984 | -0.0013421 | 0.0101870 | 1.0000000 | 0.131E+00<br>0.877E-01 |
| 234 | E2 0.9CC0C02-0.2000000 | 3.67387295 | -0.0015483 | 0.0050860 | 1.0000000 | 0.359E+00<br>0.212E-01 |
| 235 | E3 0.9CC0C02-0.3000001 | 3.65244961 | -0.0014436 | 0.0042624 | 1.0000000 | 0.393E+00<br>0.113E-01 |
| 236 | E4 0.9CC0002-0.4000001 | 3.62401962 | -0.0025264 | 0.0053644 | 1.0000000 | 0.396E+00<br>0.952E-02 |
| 237 | E5-0.1CC0000-0.1000000 | 4.27035427 | 0.0147112 | 0.0053823 | 1.0000000 | -0.130E+00<br>0.787E-02 |
| 238 | E6-0.10C0000-0.2000000 | 4.22624493 | 0.0095235 | 0.0066810 | 1.0000000 | 0.238E+00<br>0.586E-02 |
| 239 | E7-0.10C0C00-0.3000001 | 4.16185284 | 0.0041337 | 0.0040550 | 1.0000000 | 0.371E+00<br>0.274E-02 |
| 240 | E8-0.10C0000-0.4000001 | 4.08772659 | 0.0042783 | 0.0002921 | 1.0000000 | 0.433E+00<br>0.420E-02 |
| 241 | E9-0.10C0000-0.5000001 | 4.00919724 | 0.0043494 | -0.0005121 | 1.0000000 | 0.440E+00<br>0.446E-02 |
| 242 | 9C-0.10C0000-0.6000001 | 3.92863178 | 0.0039951 | -0.0010854 | 1.0000000 | 0.443E+00<br>0.418E-02 |
| 243 | 91-0.10C0000-0.7000002 | 3.84831238 | 0.0047560 | 0.0026555 | 1.0000000 | 0.423E+00<br>0.437E-02 |
| 244 | 92-0.10C0000-0.8000002 | 3.76727295 | 0.0039786 | 0.0017930 | 1.0000000 | 0.429E+00<br>0.375E-02 |
| 245 | 93-0.10C0000-0.9000002 | 3.68702126 | 0.0035077 | 0.0020164 | 1.0000000 | 0.425E+00<br>0.328E-02 |
| 246 | 95-0.20C0000-0.1000000 | 4.22610664 | 0.0081304 | -0.0019015 | 1.0000000 | 0.559E+00<br>0.123E-01 |
| 247 | 96-0.20C0000-0.2000000 | 4.18555886 | 0.0041428 | 0.0002035 | 1.0000000 | 0.431E+00<br>0.393E-02 |
| 248 | 97-0.20C0000-0.3000001 | 4.12814045 | 0.0044076 | -0.0010101 | 1.0000000 | 0.452E+00<br>0.510E-02 |
| 249 | 98-0.20C0000-0.4000001 | 4.06009197 | 0.0037007 | 0.0011150 | 1.0000000 | 0.425E+00<br>0.313E-02 |
| 250 | 99-0.20C0000-0.5000001 | 3.98577881 | 0.0051745 | -0.0024257 | 1.0000000 | 0.455E+00<br>0.617E-02 |
| 251 | 10C-0.20C0000-0.6000001 | 3.90910721 | 0.0044245 | 0.0000304 | 1.0000000 | 0.436E+00<br>0.441E-02 |
| 252 | 101-0.20C0000-0.7000002 | 3.83107567 | 0.0040914 | 0.0012819 | 1.0000000 | 0.430E+00<br>0.462E-02 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 253 | 102-0.2000000-0.8000002 | 3.75158841 | 0.0047681 | -0.0003018 | 1.0000000 | 0.437E+00<br>0.484E-02 |
| 254 | 103-0.2000000-0.9000002 | 3.67387295 | 0.0044110 | 0.0016944 | 1.0000000 | 0.430E+00<br>0.403E-02 |
| 255 | 105-0.3000001-0.1000000 | 4.16185093 | 0.0059174 | -0.0011642 | 1.0000000 | 0.494E+00<br>0.945E-02 |
| 256 | 106-0.3000001-0.2000000 | 4.12813854 | 0.0041028 | -0.0032583 | 1.0000000 | 0.512E+00<br>0.916E-02 |
| 257 | 107-0.3000001-0.3000001 | 4.07840347 | 0.0058767 | -0.0018986 | 1.0000000 | 0.463E+00<br>0.782E-02 |
| 258 | 108-0.3000001-0.4000001 | 4.01757249 | 0.0055481 | -0.0004456 | 1.0000000 | 0.441E+00<br>0.589E-02 |
| 259 | 109-0.3000001-0.5000001 | 3.94568987 | 0.0038897 | 0.0001729 | 1.0000000 | 0.435E+00<br>0.379E-02 |
| 260 | 110-0.3000001-0.6000001 | 3.87759168 | 0.0014038 | 0.0028040 | 1.0000000 | 0.420E+00<br>-0.119E-05 |
| 261 | 111-0.3000001-0.7000002 | 3.80363274 | 0.0057877 | 0.0001283 | 1.0000000 | 0.436E+00<br>0.573E-02 |
| 262 | 112-0.3000001-0.8000002 | 3.72776127 | 0.0039158 | -0.0009817 | 1.0000000 | 0.440E+00<br>0.429E-02 |
| 263 | 113-0.3000001-0.9000002 | 3.65244675 | 0.0043796 | 0.0014074 | 1.0000000 | 0.431E+00<br>0.391E-02 |
| 264 | 115-0.4000001-0.1000000 | 4.08772755 | 0.0030699 | -0.0067881 | 1.0000000 | 0.746E+00<br>0.324E-01 |
| 265 | 116-0.4000001-0.2000000 | 4.06008539 | 0.0037223 | -0.0015037 | 1.0000000 | 0.467E+00<br>0.678E-02 |
| 266 | 117-0.4000001-0.3000001 | 4.01757717 | 0.0054762 | -0.0023428 | 1.0000000 | 0.467E+00<br>0.866E-02 |
| 267 | 118-0.4000001-0.4000001 | 3.96364498 | 0.0033165 | -0.0030042 | 1.0000000 | 0.464E+00<br>0.636E-02 |
| 268 | 119-0.4000001-0.5000001 | 3.90272331 | 0.0048903 | -0.0016623 | 1.0000000 | 0.448E+00<br>0.623E-02 |
| 269 | 120-0.4000001-0.6000001 | 3.83672810 | 0.0056588 | -0.0005514 | 1.0000000 | 0.439E+00<br>0.603E-02 |
| 270 | 121-0.4000001-0.7000002 | 3.76726532 | 0.0052356 | -0.0003752 | 1.0000000 | 0.438E+00<br>0.545E-02 |
| 271 | 122-0.4000001-0.8000002 | 3.69570827 | 0.0047471 | -0.0006989 | 1.0000000 | 0.439E+00<br>0.510E-02 |
| 272 | 123-0.4000001-0.9000002 | 3.62401772 | 0.0060118 | 0.0022422 | 1.0000000 | 0.429E+00<br>0.571E-02 |
| 273 | 125-0.5000001-0.1000000 | 4.00919342 | 0.0018274 | -0.0073021 | 1.0000000 | 0.737E+00<br>0.469E-01 |
| 274 | 126-0.5000001-0.2000000 | 3.98578453 | 0.0010449 | -0.0035129 | 1.0000000 | 0.504E+00<br>0.957E-02 |
| 275 | 127-0.5000001-0.3000001 | 3.94968997 | 0.0041708 | -0.0027468 | 1.0000000 | 0.470E+00<br>0.881E-02 |
| 276 | 128-0.5000001-0.4000001 | 3.90272617 | 0.0044854 | -0.0027889 | 1.0000000 | 0.461E+00<br>0.871E-02 |

| | | | | | |
|---|---|---|---|---|---|
| 277 | 129-0.5000001-0.5000001 | 3.84830856 | 0.0062366 | -0.0015669 | 1.0000000 | 0.447E+00<br>0.782E-02 |
| 278 | 130-0.5000001-0.6000001 | 3.78745365 | 0.0050076 | -0.0029344 | 1.0000000 | 0.452E+00<br>0.747E-02 |
| 279 | 131-0.5000001-0.7000002 | 3.72306919 | 0.0049517 | -0.0027953 | 1.0000000 | 0.449E+00<br>0.696E-02 |
| 280 | 132-0.5000001-0.8000002 | 3.65608788 | 0.0040864 | -0.0017462 | 1.0000000 | 0.443E+00<br>0.518E-02 |
| 281 | 134-0.6000001-0.1000000 | 3.92862511 | -0.0004995 | -0.0001280 | 1.0000000 | 0.441E+00<br>0.359E-03 |
| 282 | 135-0.6000001-0.2000000 | 3.90910625 | 0.0034603 | -0.0058221 | 1.0000000 | 0.541E+00<br>0.213E-01 |
| 283 | 136-0.6000001-0.3000001 | 3.87759454 | 0.0028021 | 0.0014182 | 1.0000000 | 0.420E+00<br>-0.341E-04 |
| 284 | 137-0.6000001-0.4000001 | 3.83672237 | 0.0053756 | -0.0032259 | 1.0000000 | 0.463E+00<br>0.103E-01 |
| 285 | 138-0.6000001-0.5000001 | 3.78746128 | 0.0025885 | -0.0016244 | 1.0000000 | 0.447E+00<br>0.454E-02 |
| 286 | 139-0.6000001-0.6000001 | 3.73239708 | 0.0039631 | -0.0039016 | 1.0000000 | 0.457E+00<br>0.788E-02 |
| 287 | 140-0.6000001-0.7000002 | 3.67386723 | 0.0056053 | -0.0013611 | 1.0000000 | 0.442E+00<br>0.678E-02 |
| 288 | 142-0.7000002-0.1000000 | 3.84832096 | 0.0043796 | -0.0071148 | 1.0000000 | 0.687E+00<br>0.564E-01 |
| 289 | 143-0.7000002-0.2000000 | 3.83107758 | 0.0035011 | -0.0027625 | 1.0000000 | 0.483E+00<br>0.133E-01 |
| 290 | 144-0.7000002-0.3000001 | 3.80363655 | 0.0037598 | -0.0027022 | 1.0000000 | 0.466E+00<br>0.191E-01 |
| 291 | 145-0.7000002-0.4000001 | 3.76727200 | 0.0034752 | -0.0015071 | 1.0000000 | 0.448E+00<br>0.412E-02 |
| 292 | 146-0.7000002-0.5000001 | 3.72307587 | 0.0023584 | -0.0022746 | 1.0000000 | 0.451E+00<br>0.555E-02 |
| 293 | 147-0.7000002-0.6000001 | 3.67386532 | 0.0056748 | -0.0025954 | 1.0000000 | 0.449E+00<br>0.872E-02 |
| 294 | 148-0.7000002-0.7000002 | 3.61972523 | 0.0062596 | -0.0005374 | 1.0000000 | 0.440E+00<br>0.720E-02 |
| 295 | 150-0.8000002-0.1000000 | 3.76727200 | 0.0029543 | -0.0052318 | 1.0000000 | 0.608E+00<br>0.458E-01 |
| 296 | 151-0.8000002-0.2000000 | 3.75198936 | 0.0019566 | -0.0042466 | 1.0000000 | 0.565E+00<br>0.191E-01 |
| 297 | 152-0.8000002-0.3000001 | 3.72776699 | 0.0017095 | -0.0032434 | 1.0000000 | 0.479E+00<br>0.104E-01 |
| 298 | 153-0.8000002-0.4000001 | 3.69571018 | 0.0029348 | -0.0025342 | 1.0000000 | 0.456E+00<br>0.892E-02 |
| 299 | 154-0.8000002-0.5000001 | 3.65608978 | 0.0016521 | -0.0013728 | 1.0000000 | 0.445E+00<br>0.385E-02 |
| 300 | 155-0.8000002-0.6000001 | 3.61077976 | 0.0036529 | -0.0034468 | 1.0000000 | 0.453E+00<br>0.826E-02 |

```
 301  157-0.9000002-0.1000000  3.66702984  0.0034696-0.0090484 1.0000000   0.723E+00
                                                                          0.872E-01
 302  158-0.9000002-0.2000000  3.67387199  0.0035476-0.0039124 1.0000000   0.496E+00
                                                                          0.213E-01
 303  159-0.9000002-0.3000001  3.65244675  0.0037126-0.0025461 1.0000000   0.462E+00
                                                                          0.114E-01
 304  160-0.9000002-0.4000001  3.62401962  0.0056739-0.0017174 1.0000000   0.449E+00
                                                                          0.955E-02

 END OF SKEW RAY TRACE.

   TOTAL NUMBER OF RAYS TRACED =  304
   TOTAL NUMBER OF MIRROR IMAGE RAYS =  144
   TOTAL NUMBER OF RAYS STRIKING IMAGE PLANE =  304
1 IMAGE PLANE SPOT DIAGRAM ANALYSIS:

 THICKNESS =0.0500000  U =0.0        ALFAP =0.0        R =1.0000000

 CENTROID: YCENTR =  0.0,  ZCENTR =  0.0027303

 STANDARD DEVIATIONS:  SIGMAY =  0.0000085  SIGMAZ =  0.0000194

 RMS SPOT SIZE: RMSRAD =  0.0052860

 SPOT DIAGRAM ENERGY DENSITY VS. RADIUS FROM CENTROID:
  IZ4     RADIUS    FRACTION

    1  0.0050000  0.6776316
    2  0.0100000  0.9605263
    3  0.0150000  0.9835526
    4  0.0200000  1.0000000
    5  0.0250000  1.0000000
    6  0.0300000  1.0000000
    7  0.0350000  1.0000000
    8  0.0400000  1.0000000
    9  0.0450000  1.0000000
   10  0.0500000  1.0000000
   11  0.0550000  1.0000000
   12  0.0600000  1.0000000
   13  0.0649999  1.0000000
   14  0.0699999  1.0000000
   15  0.0749999  1.0000000
   16  0.0799999  1.0000000
   17  0.0849999  1.0000000
   18  0.0899999  1.0000000
   19  0.0949999  1.0000000
   20  0.0999999  1.0000000
   21  0.1049999  1.0000000
   22  0.1099999  1.0000000
   23  0.1149999  1.0000000
   24  0.1199999  1.0000000
   25  0.1249999  1.0000000
   26  0.1299999  1.0000000
   27  0.1349999  1.0000000
   28  0.1399999  1.0000000
   29  0.1449999  1.0000000
   30  0.1499999  1.0000000
   31  0.1549999  1.0000000
   32  0.1599999  1.0000000
   33  0.1649999  1.0000000
   34  0.1699999  1.0000000
   35  0.1749999  1.0000000
   36  0.1799999  1.0000000
   37  0.1849999  1.0000000
```

| | | |
|---|---|---|
| 38 | 0.1899998 | 1.0000000 |
| 39 | 0.1949998 | 1.0000000 |
| 40 | 0.1999998 | 1.0000000 |
| 41 | 0.2049998 | 1.0000000 |
| 42 | 0.2099998 | 1.0000000 |
| 43 | 0.2149998 | 1.0000000 |
| 44 | 0.2199998 | 1.0000000 |
| 45 | 0.2249998 | 1.0000000 |
| 46 | 0.2299998 | 1.0000000 |
| 47 | 0.2349998 | 1.0000000 |
| 48 | 0.2399998 | 1.0000000 |
| 49 | 0.2449998 | 1.0000000 |
| 50 | 0.2499998 | 1.0000000 |
| 51 | 0.2549998 | 1.0000000 |
| 52 | 0.2599998 | 1.0000000 |
| 53 | 0.2649998 | 1.0000000 |
| 54 | 0.2699998 | 1.0000000 |
| 55 | 0.2749998 | 1.0000000 |
| 56 | 0.2799998 | 1.0000000 |
| 57 | 0.2849998 | 1.0000000 |
| 58 | 0.2899998 | 1.0000000 |
| 59 | 0.2949998 | 1.0000000 |
| 60 | 0.2999998 | 1.0000000 |
| 61 | 0.3049998 | 1.0000000 |
| 62 | 0.3099998 | 1.0000000 |
| 63 | 0.3149998 | 1.0000000 |
| 64 | 0.3199998 | 1.0000000 |
| 65 | 0.3249998 | 1.0000000 |
| 66 | 0.3299998 | 1.0000000 |
| 67 | 0.3349998 | 1.0000000 |
| 68 | 0.3399998 | 1.0000000 |
| 69 | 0.3449998 | 1.0000000 |
| 70 | 0.3499998 | 1.0000000 |
| 71 | 0.3549998 | 1.0000000 |
| 72 | 0.3599998 | 1.0000000 |
| 73 | 0.3649998 | 1.0000000 |
| 74 | 0.3699998 | 1.0000000 |
| 75 | 0.3749998 | 1.0000000 |
| 76 | 0.3799998 | 1.0000000 |
| 77 | 0.3849998 | 1.0000000 |
| 78 | 0.3899998 | 1.0000000 |
| 79 | 0.3949998 | 1.0000000 |
| 80 | 0.3999998 | 1.0000000 |
| 81 | 0.4049998 | 1.0000000 |
| 82 | 0.4099998 | 1.0000000 |
| 83 | 0.4149998 | 1.0000000 |
| 84 | 0.4199998 | 1.0000000 |
| 85 | 0.4249998 | 1.0000000 |
| 86 | 0.4299998 | 1.0000000 |
| 87 | 0.4349998 | 1.0000000 |
| 88 | 0.4399998 | 1.0000000 |
| 89 | 0.4449998 | 1.0000000 |
| 90 | 0.4499998 | 1.0000000 |
| 91 | 0.4549998 | 1.0000000 |
| 92 | 0.4599998 | 1.0000000 |
| 93 | 0.4649998 | 1.0000000 |
| 94 | 0.4699998 | 1.0000000 |
| 95 | 0.4749998 | 1.0000000 |
| 96 | 0.4799998 | 1.0000000 |
| 97 | 0.4849998 | 1.0000000 |
| 98 | 0.4899998 | 1.0000000 |
| 99 | 0.4949998 | 1.0000000 |
| 100 | 0.4999998 | 1.0000000 |

SPOT DIAGRAM CALCULATIONS COMPLETE.
TO OBTAIN PLOTS FROM THE PLOTTER OR THE PRINTER,
ISSUE THE FOLLOWING COMMAND:
FOR PRINTER PLOTS ENTER "LENSCOM PRINTER"
FOR PLOTTER GRAPHS ENTER "LENSCOM PLOTTER"
END OF PROGRAM

## 12. SUMMARY OF THE REPORT

Lens design and ray tracing to determine optical aberrations requires efficient computer codes. A clearly structured computer code with efficient algorithms has been developed to design a lens incorporating gradient refractive index, GRIN. One surface of the lens, either the inside or outside surface, is a circular cone.

The computer code includes lens design and calculation of optical aberration for a lens using a homogeneous material, i.e., for n equal to a constant. The homogeneous case is included for several reasons. The simpler case with n equal to a constant provides insight to the more complex case of variable n. Extensive computer codes require a check on the validity of the output. The homogeneous case provides a check. When the factor B is equal to zero in equation [2.9], the results for the two computer programs with and without GRIN should be identical. Needless to say, the results are identical for the programs reported here.

The case of a lens with GRIN and with a circular cone for the outside surface has been programmed. The companion case with the circular cone on the inside is being developed by Carr [15]. Carr's program can be readily incorporated into this computer code.

The program has been exercised for the case of 5% variation in refractive index for both negative and positive

values for B. The aim of the preliminary calculations was to verify operation of the computer program. More extensive calculations are required in order to understand the influence of various variables. As more experience is gained, the program should be combined with an optimization code to permit thorough and efficient lens design.

The selection of a 5% variation in refractive index was based on current state-of-the-art in the production of GRIN materials. A wider variation in refractive index may be needed.

The program is restricted currently to values of $X_c$ satisfying the constraint $X_c \leq 0$. Additional work is needed to permit designs using positive values of $X_c$. When $X_c$ is positive, the angle $\theta$ at some point along the ray interior to the lens has a critical value at which $dr/d\theta$ changes sign. The critical value causes computational difficulties.

## 13. REFERENCES


1. J. M. Terrell, "Conical Lens for 5"/54 Gun Launched Missile," Master's Thesis, NPS, Monterey, California, June 1981.

2. D. T. Moore, "Gradient - Index Optics: A Review," Applied Optics, 19 (7), p. 1035, April 1980.

3. K. Iga, "Theory for Gradient - Index Imaging," ibid., p. 1039.

4. E. W. Marchand, "Photographic Gradient Singlets," ibid., p. 1044.

5. K. Nishizawa, "Chromatic Aberration of Selfoc Lens as an Imaging System," ibid., p. 1052.

6. S. J. S. Brown, " Geometrical Optics of Tapered Gradient - Index Rods," ibid., p. 1056.

7. K. Kikuchi, et. al., "Design of Gradient - Index Spherical Lenses for Optical Pickup Systems," ibid., p. 1076.

8. D. T. Moore, et. al., "Radial Gradient - Index Lenses With Zero Petzval Aberration," ibid., p. 1081.

9. D. T. Moore, et. al., "Chromatic Variation of Index of Refraction Gradients - Part I," ibid., 1096.

10. K. Iga, et. al., "Evaluation of Gradient - Index Rod Lenses by Imaging," ibid., p. 1101.

11. K. Iga, et. al., "Aberration Improvement of Selfoc Lenses," ibid., p. 1113.

12. W. J. Tomlinson, "Aberrations of GRIN - Rod Lenses in Multimode Optical Fiber Devices," ibid., p. 1117.

13. E. W. Marchand, Gradient Index Optics, Academic Press, New York, 1978.

14. R. L. Fraizier, "Exterior Ballistics, Guidance Laws and Optics for a Ramjet Propelled Gun-Launched Missile," Master's Thesis, NPS, Monterey, California, December 1980.

15. H. M. Carr, Master's Thesis, NPS, Monterey, California, to be published in September 1982.

16. R. Kingslake, Lens Design Fundamentals, Academic Press, New York, 1978.

## INITIAL DISTRIBUTION LIST

| | | No. Copies |
|---|---|---|
| 1. | Defense Technical Information Center<br>Cameron Station<br>Alexandria, Virginia 22314 | 2 |
| 2. | Library, Code 0142<br>Naval Postgraduate School<br>Monterey, California 93940 | 2 |
| 3. | Department Chairman, Code 67<br>Department of Aeronautics<br>Naval Postgraduate School<br>Monterey, California 93940 | 1 |
| 4. | Distinguished Professor A. E. Fuhs<br>Code 67Fu<br>Department of Aeronautics<br>Naval Postgraduate School<br>Monterey, California 93940 | 4 |
| 5. | LTC Rene Larriva, USMC<br>Defense Advanced Research Projects Agency<br>1400 Wilson Blvd.<br>Arlington, Virginia 22209 | 2 |
| 6. | Commander, Naval Sea Systems Command<br>Naval Sea Systems Command Headquarters<br>Attn: Code 62YC<br>Washington, D.C. 20362 | 1 |
| 7. | Mr. Conrad Brandts<br>Naval Surface Weapons Center<br>Dahlgren, Virginia 22448 | 1 |
| 8. | Dr. Fred Billig<br>Applied Physics Lab<br>Johns Hopkins Road<br>Laurel, Maryland 20810 | 1 |
| 9. | Commander, U.S. Army Armament Research and Development Command (ARRAD COM)<br>Attn: Mr. Lou Marino<br>Dover, N.J. 07801 | 1 |
| 10. | Deputy Chief of Staff for Research, Development and Studies<br>Headquarters USMC<br>Washington, D.C. 20370 | 1 |

11. Commander 1
Development Command
USMC Base
Quantico, Virginia 22134

12. Commander 1
Artillery Development Command
Fort Sill, Oklahoma 73503

13. Captain Herbert Carr, USA 1
c/o Code 33
Naval Postgraduate School
Monterey, California 93940

14. Dr. Lloyd Smith 1
Code 3205
Naval Weapons Center
China Lake, California 93555

15. Dr. Harold L. Bennett 1
Code 3272
Naval Weapons Center
China Lake, California 93555

16. Dr. T. G. Bergman 1
Code 3941
Naval Weapons Center
China Lake, California 93555

17. Dr. Oded Amichai 4
Visiting Research Associate
Department of Aeronautics
Naval Postgraduate School
Monterey, California 93940

18. Research Administration 1
Code 012A
Naval Postgraduate School
Monterey, California 93940