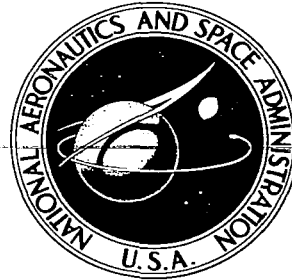


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**GEOMETRICAL AND INERTIAL PROPERTIES
OF A CLASS OF THIN SHELLS
OF A GENERAL TYPE**

by Will J. Worley and Han-chung Wang

Prepared under Grant No. NsG-434 by

UNIVERSITY OF ILLINOIS

Urbana, Ill.

for

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SUMMARY

This second report under the current grant is concerned with the evaluation of surface area, (or surface volumes when multiplied by the shell thickness), centroids of surface volumes or masses and moments of inertia for thin walled shells. The shells are defined by the first octant of

$\left|\frac{x}{a}\right|^a + \left|\frac{y}{b}\right|^\beta + \left|\frac{z}{c}\right|^\gamma = 1$ where $a, b, c, \alpha, \beta,$ and γ are positive constants not necessarily integers.

The above characteristics of thirty-two representative configurations are presented along with the first octant coordinate points necessary to represent these configurations.

The computation, using the Gaussian quadrature method and performed on an IBM 7094 digital computer, consists of five place tables in floating point notation.

Appendixes present the corresponding characteristics of solid bodies, in terms of gamma functions. The FORTRAN program for Table I also appears in Appendix C.



TABLE OF CONTENTS

SUMMARY- - - - -	iii
INTRODUCTION - - - - -	1
1. Statement of the Problem - - - - -	1
2. Symbols for General Shells - - - - -	3
3. Acknowledgement - - - - -	4
EQUATION CHARACTERISTICS - - - - -	5
1. Surface Area and Surface Volume- - - - -	5
2. Centroids of Surface Volumes of Thin Shells of a General Type - -	6
3. Moments of Inertia of Thin Shells of a General Type - - - - -	8
4. Dimensionless Form of Equations - - - - -	9
NUMERICAL INTEGRATION- - - - -	13
1. Gaussian Quadrature Rule - - - - -	13
2. Evaluation of the Integrals- - - - -	15
TABULATED RESULTS - - - - -	21
1. Range of Values of a , β and γ - - - - -	21
2. Range of Values of b/a and c/a - - - - -	21
3. Floating Point Notation - - - - -	22
4. Discussion of Tables I and II- - - - -	22
5. Discussion of Tables III and IV- - - - -	22
TABLES - - - - -	23
I. Geometrical and Inertial Characteristics of Thin Shells - - - - -	23
II. Values of x/a , y/b and z/c - - - - -	27
III. Geometrical and Inertial Characteristics of General Solids - - - -	43
IV. Geometrical and Inertial Characteristics of Solids of Revolution - -	47
APPENDIXES- - - - -	51
A. Symbols for Appendix B - - - - -	51
B. Volumes, Centroids and Moments of Inertia of Bodies Defined by Eq. (2. 1) - - - - -	52
C. FORTRAN Program - - - - -	55
REFERENCES - - - - -	63
FIGURES - - - - -	65
1. Configuration for Three Exponents Greater than One - - - - -	65
2. Configuration for One Exponent Greater than One - - - - -	65
3. Configuration for Two Exponents Greater than One - - - - -	66
4. Projection Planes for Three Region Integration- - - - -	66
5. Projection Planes for Two Region Integration - - - - -	67
6. Projection Planes for One Region Integration- - - - -	67

INTRODUCTION

1. Statement of the Problem

Current and projected designs of vehicles for space craft, aircraft, ocean surface vessels and submarine craft include shapes which are more general than those generated as bodies of revolution. The discussion of the properties of various closed three dimensional shapes in relatively simple analytical form is the objective of this report.

The information and FORTRAN programs provided will make it possible to explore various shapes which show promise of improved performance. The improvement may lie in the direction of superior structural resistance or in better aerodynamic or hydrodynamic performance.

The equation under consideration is defined as

$$\left| \frac{x}{a} \right|^{\alpha} + \left| \frac{y}{b} \right|^{\beta} + \left| \frac{z}{c} \right|^{\gamma} = 1 \quad (2.1)^*$$

where a , b , c , α , β and γ are positive constants, not necessarily integers.

The geometrical and the inertial properties of solid bodies bounded by Eq. (2.1) were treated in 1957 by Worley and Breuer [1]**. The features of that paper which pertain to Eq. (2.1) appear in Appendix B of this report. Gamma functions were used in 1839 by Dirichlet [2], to evaluate a class of functions which includes Eq. (2.1).

The current report treats the geometrical and the inertial properties of thin shell structures described by Eq. (2.1). Only the first octant is considered, thus the surface area of a full closed shell would require multiplying the tabulated value by eight. The first octant surface area, which becomes the surface volume when multiplied by the shell thickness, or the mass when multiplied by thickness and mass density, is calculated as well as the centroids of the surface area, surface volume, or shell mass.

The necessary integrals were evaluated using Gaussian quadrature and the computation was performed on an IBM 7094 digital computer.

*The notation (2.1) is adopted to aid in cross referencing equations from the initial report in this series [4].

**Numbers in brackets refer to the References.

Recent interest in three dimensional shapes appears in 1964 publications by Trimble and Nickell [5], where underwater craft are discussed, and in a publication by the Mitsubishi Shipbuilding & Engineering Co., Nagasaki, Japan [6], where 23.5 per cent power reduction resulted from ship hull design modifications for ships of similar size and speed. Unfortunately, reference [6] contains no specific details, but it does indicate the potential gains available in redesign even in a field as highly developed and of as long standing as the building of ocean surface vessels.

The first report [4] was concerned with the characteristics of thin shells of revolution while the present report is concerned with thin shells of more nearly general configurations. Many volumes would be required to publish possible shapes and since only a few would be of ultimate use, results for a limited number of shapes are presented with the necessary FORTRAN programs for the evaluation of specific shapes as needed.

Figures 1, 2, and 3 represent possible shapes for bodies having all eight octants identical. Certain restricted shapes are possible where all octants are not identical. A given configuration is altered perceptibly if viewed from a different position or with different values of b/a and c/a . Figure 3, for example, takes on the appearance of a canoe if part of the upper half plane is removed and length, width and depth dimensions suitably altered. It is possible that shapes within the range of definition by Eq. (2.1) would offer better performance characteristics even for a surface craft as well established as the canoe. Much more rewarding avenues of investigation apply however to vessels for which substantial power and fuel economics may be realized from carefully redesigned contours such as those reported under [6] above.

2. Symbols for General Shells

a	x coordinate of Eq.(2. 1) at y = z = 0, [L] *
b	y coordinate of Eq.(2. 1) at x = z = 0, [L]
c	z coordinate of Eq.(2. 1) at x = y = 0, [L]
x, y, z	rectangular coordinates of Eq.(2. 1), [L]
$\left. \begin{matrix} \bar{x}_{sg} \\ \bar{y}_{sg} \\ \bar{z}_{sg} \end{matrix} \right\}$	$\left\{ \begin{matrix} \text{rectangular coordinates of the centroid of the} \\ \text{first octant of the surface area, surface volume, or} \\ \text{shell mass for Eq.(2. 1), [L]} \end{matrix} \right.$
t	shell thickness
A_{sg}	surface area for the first octant of Eq.(2. 1), [L ²]
$\left. \begin{matrix} I_{xysg} \\ I_{yzsg} \\ I_{zxsg} \end{matrix} \right\}$	$\left\{ \begin{matrix} \text{mass moments of inertia of thin shell of a general type with} \\ \text{respect to the xy, yz and zx planes respectively, [ML}^{-3}\text{]} \end{matrix} \right.$
$\left. \begin{matrix} I_{xsg} \\ I_{ysg} \\ I_{zsg} \end{matrix} \right\}$	mass moment of inertia about x-, y-, z- axes, [L]
ρ	mass density, [ML ⁻³]
$\left. \begin{matrix} \alpha \\ \beta \\ \gamma \end{matrix} \right\}$	exponents of the absolute values of $\left\{ \begin{matrix} x/a \\ y/b \\ z/c \end{matrix} \right\}$, [1]

* The dimensional notation [L] indicates a length while [M] indicates mass and [1] indicates a dimensionless quantity.

3. Acknowledgement

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The investigation was part of the work of the Engineering Experiment Station of which Professor Ross J. Martin is Director and was conducted in the Department of Theoretical and Applied Mechanics of which Professor Thomas J. Dolan is Head.

Several persons contributed to the programming of the integrals under consideration. Mr. Charles Cecil Fretwell, Instructor in Theoretical and Applied Mechanics, University of Illinois, initiated the programming using Simpson's rule. Mr. Paul S. Cheng, Development Laboratory, Data System Division, International Business Machines Corporation, Poughkeepsie, New York, and later Mr. Frank Schaffer, Research Assistant, Digital Computer Laboratory, University of Illinois, helped to obtain solutions using the Gaussian quadrature method. Miss Marjorie Ann Moretz assisted with some mathematical formulations. The efforts and suggestions of these graduate students are sincerely appreciated.

The authors wish to acknowledge the assistance of the following undergraduate students: Messrs. Tom E. Breuer, Bruce J. Gaumond, and Richard J. Langrehr who assisted with various stages of the report preparation or programming and Mr. Kenneth N. Archambault who prepared the drawings.

The IBM 7094 computer facility, used to obtain the tabulated results, is partially supported by the National Science Foundation under grant NSFGP700.

EQUATION CHARACTERISTICS

1. Surface Area and Surface Volume

A smooth, three dimensional, surface S may be represented in the explicit form $z = f(x, y)$, (x, y) in region R_{xy} . The area of S is given by the integral

$$A_{sg} = \iint_{R_{xy}} \sec \phi \, dx dy = \iint_{R_{xy}} \sqrt{1 + \left(\frac{\partial z}{\partial x}\right)^2 + \left(\frac{\partial z}{\partial y}\right)^2} \, dx dy \quad (2.2)$$

where ϕ is the angle between the upper normal to S and the z direction.

The surface of interest in this study

$$\left|\frac{x}{a}\right|^a + \left|\frac{y}{b}\right|^\beta + \left|\frac{z}{c}\right|^\gamma = 1 \quad (2.3)$$

can be expressed in the form

$$z = c \left[1 - \left|\frac{x}{a}\right|^a + \left|\frac{y}{b}\right|^\beta \right]^{1/\gamma} \quad (2.4)$$

The partial derivatives of z with respect to x and y are

$$\frac{\partial z}{\partial x} = -\left(\frac{c}{a} \frac{a}{\gamma}\right) \left|\frac{x}{a}\right|^{a-1} \left[1 - \left|\frac{x}{a}\right|^a - \left|\frac{y}{b}\right|^\beta \right]^{(1-\gamma)/\gamma} \quad (2.5)$$

$$\frac{\partial z}{\partial y} = -\left(\frac{c}{b} \frac{\beta}{\gamma}\right) \left|\frac{y}{b}\right|^{\beta-1} \left[1 - \left|\frac{x}{a}\right|^a - \left|\frac{y}{b}\right|^\beta \right]^{(1-\gamma)/\gamma} \quad (2.6)$$

Therefore

$$A_{sg} = \iint_{R_{xy}} F(x, y) \, dx dy \quad (2.7)$$

where

$$F(x, y) = \left\{ 1 + \left(\left(\frac{c}{a} \frac{a}{\gamma}\right) \left|\frac{x}{a}\right|^{a-1} \left[1 - \left|\frac{x}{a}\right|^a - \left|\frac{y}{b}\right|^\beta \right]^{(1-\gamma)/\gamma} \right)^2 + \left(\left(\frac{c}{b} \frac{\beta}{\gamma}\right) \left|\frac{y}{b}\right|^{\beta-1} \left[1 - \left|\frac{x}{a}\right|^a - \left|\frac{y}{b}\right|^\beta \right]^{(1-\gamma)/\gamma} \right)^2 \right\}^{1/2} \quad (2.8)$$

Similarly, the surface S of Eq.(2.3) can be expressed in the forms

$$y = g(x, z) \text{ or } x = h(y, z)$$

Therefore the area of S may be generated as

$$A_{sg} = \iint_{R_{xz}} G(x, z) dx dz = \iint_{R_{yz}} H(y, z) dy dz \quad (2.9)$$

where

$$G(x, z) = \left\{ 1 + \left(\left(\frac{b}{a} \frac{a}{\beta} \right) \left| \frac{x}{a} \right|^{a-1} \left[1 - \left| \frac{x}{a} \right|^a - \left| \frac{z}{c} \right|^\gamma \right]^{(1-\beta)/\beta} \right)^2 + \left(\left(\frac{b}{c} \frac{\gamma}{\beta} \right) \left| \frac{z}{c} \right|^{\gamma-1} \left[1 - \left| \frac{x}{a} \right|^a - \left| \frac{z}{c} \right|^\gamma \right]^{(1-\beta)/\beta} \right)^2 \right\}^{1/2} \quad (2.10)$$

$$H(y, z) = \left\{ 1 + \left(\left(\frac{a}{b} \frac{\beta}{a} \right) \left| \frac{y}{b} \right|^{\beta-1} \left[1 - \left| \frac{y}{b} \right|^\beta - \left| \frac{z}{c} \right|^\gamma \right]^{(1-a)/a} \right)^2 + \left(\left(\frac{a}{c} \frac{\gamma}{a} \right) \left| \frac{z}{c} \right|^{\gamma-1} \left[1 - \left| \frac{y}{b} \right|^\beta - \left| \frac{z}{c} \right|^\gamma \right]^{(1-a)/a} \right)^2 \right\}^{1/2} \quad (2.11)$$

The surface volume is obtained when A_{sg} is multiplied by the shell thickness to give V_{sg} .

2. Centroids of Surface Volumes of Thin Shells of a General Type

The location of the centroid of the surface S can be expressed in general as

$$\begin{aligned} \bar{x}_{sg} &= \frac{1}{A_{sg}} \iint x dA \\ \bar{y}_{sg} &= \frac{1}{A_{sg}} \iint y dA \\ \bar{z}_{sg} &= \frac{1}{A_{sg}} \iint z dA \end{aligned} \quad (2.12)$$

Since the area, A_{sg} , may be integrated over the three different regions,

R_{xy} , R_{yz} , and R_{xz} , the location of the centroid is expressed in three different ways as follows.

$$\begin{aligned}
 \bar{x}_{sg} &= \frac{1}{A_{sg}} \iint_{R_{xy}} x F(x, y) \, dx dy \\
 &= \frac{1}{A_{sg}} \iint_{R_{yz}} a \left[1 - \left| \frac{y}{b} \right|^\beta - \left| \frac{z}{c} \right|^\gamma \right]^{1/a} H(y, z) \, dy dz \\
 &= \frac{1}{A_{sg}} \iint_{R_{xz}} x G(x, z) \, dx dz \tag{2.13}
 \end{aligned}$$

$$\begin{aligned}
 \bar{y}_{sg} &= \frac{1}{A_{sg}} \iint_{R_{xy}} y F(x, y) \, dx dy \\
 &= \frac{1}{A_{sg}} \iint_{R_{yz}} y H(y, z) \, dy dz \\
 &= \frac{1}{A_{sg}} \iint_{R_{xz}} b \left[1 - \left| \frac{x}{a} \right|^a - \left| \frac{z}{c} \right|^\gamma \right]^{1/\beta} G(x, z) \, dx dz \tag{2.14}
 \end{aligned}$$

$$\begin{aligned}
 \bar{z}_{sg} &= \frac{1}{A_{sg}} \iint_{R_{xy}} c \left[1 - \left| \frac{x}{a} \right|^a - \left| \frac{y}{b} \right|^\beta \right]^{1/\gamma} F(x, y) \, dx dy \\
 &= \frac{1}{A_{sg}} \iint_{R_{yz}} z H(y, z) \, dy dz \\
 &= \frac{1}{A_{sg}} \iint_{R_{xz}} z G(x, z) \, dx dz \tag{2.15}
 \end{aligned}$$

3. Moments of Inertia of Thin Shells of a General Type

The moments of inertia of a thin shell with constant thickness t and constant mass density ρ , with respect to xy , yz and xz planes are given as

$$\begin{aligned} I_{xysg} &= \iiint z^2 dm = \rho t \iint z^2 dA \\ I_{yzsg} &= \iiint x^2 dm = \rho t \iint x^2 dA \\ I_{zxsq} &= \iiint y^2 dm = \rho t \iint y^2 dA \end{aligned} \quad (2.16)$$

These expressions may be integrated over the regions R_{xy} , R_{yz} and R_{xz} , as

$$\begin{aligned} I_{xysg} &= \rho t \iint_{R_{xy}} c^2 \left[1 - \left| \frac{x}{a} \right|^a - \left| \frac{y}{b} \right|^\beta \right]^{2/\gamma} F(x, y) dx dy \\ &= \rho t \iint_{R_{yz}} z^2 H(y, z) dy dz \\ &= \rho t \iint_{R_{xz}} z^2 G(x, z) dx dz \end{aligned} \quad (2.17)$$

$$\begin{aligned} I_{yzsg} &= \rho t \iint_{R_{xy}} x^2 F(x, y) dx dy \\ &= \rho t \iint_{R_{yz}} a^2 \left[1 - \left| \frac{y}{b} \right|^\beta - \left| \frac{z}{c} \right|^\gamma \right]^{2/a} H(y, z) dy dz \\ &= \rho t \iint_{R_{xy}} x^2 G(x, z) dx dz \end{aligned} \quad (2.18)$$

$$\begin{aligned}
I_{zxs_g} &= \rho t \iint_{R_{xy}} y^2 F(x, y) dx dy \\
&= \rho t \iint_{R_{yz}} y^2 H(y, z) dy dz \\
&= \rho t \iint_{R_{xz}} b^2 \left[1 - \left| \frac{x}{a} \right|^a - \left| \frac{z}{c} \right|^\gamma \right]^{2/\beta} dx dz \quad (2.19)
\end{aligned}$$

The moments of inertia with respect to the x, y and z - axes are obtained by well known relationships.

$$\begin{aligned}
I_{xsg} &= I_{xysg} + I_{zxs_g} \\
I_{ysg} &= I_{xysg} + I_{yzsg} \\
I_{zsg} &= I_{zxs_g} + I_{yzsg}
\end{aligned} \quad \left. \vphantom{\begin{aligned} I_{xsg} \\ I_{ysg} \\ I_{zsg} \end{aligned}} \right\} (2.20)$$

4. Dimensionless Form of Equations

For the computer calculation, the dimensionless expressions are preferred. The above dimensional formulas may be rearranged in dimensionless form by a transformation

$$X = \frac{x}{a}, \quad Y = \frac{y}{b}, \quad Z = \frac{z}{c}$$

The dimensionless form for surface area, location of centroid and moments of inertia are as follows. The computer program is based on these formulas.

AREA

$$\frac{A_{sg}}{a^2} = \left(\frac{b}{a} \right) \iint_{R_{XY}} F_1(X, Y) dXdY$$

$$\begin{aligned}
&= \left(\frac{b}{a}\right) \left(\frac{c}{a}\right) \iint_{R_{YZ}} F_2(Y, Z) dYdZ \\
&= \left(\frac{c}{a}\right) \iint_{R_{XZ}} F_3(X, Z) dXdZ
\end{aligned} \tag{2.21}$$

CENTROID

$$\begin{aligned}
\frac{\bar{x}_{sg}}{a} &= \frac{1}{A_{sg/a}^2} \left(\frac{b}{a}\right) \iint_{R_{XY}} X F_1(X, Y) dXdY \\
&= \frac{1}{A_{sg/a}^2} \left(\frac{b}{a}\right) \left(\frac{c}{a}\right) \iint_{R_{YZ}} \left[1 - Y^\beta - Z^\gamma\right]^{1/a} F_2(Y, Z) dYdZ \\
&= \frac{1}{A_{sg/a}^2} \left(\frac{c}{a}\right) \iint_{R_{XZ}} X F_3(X, Z) dXdZ
\end{aligned} \tag{2.22}$$

$$\begin{aligned}
\frac{\bar{y}_{sg}}{b} &= \frac{1}{A_{sg/a}^2} \left(\frac{b}{a}\right) \iint_{R_{XY}} Y F_1(X, Y) dXdY \\
&= \frac{1}{A_{sg/a}^2} \left(\frac{b}{a}\right) \left(\frac{c}{a}\right) \iint_{R_{YZ}} Y F_2(Y, Z) dYdZ \\
&= \frac{1}{A_{sg/a}^2} \left(\frac{c}{a}\right) \iint_{R_{XZ}} \left[1 - X^a - Z^\gamma\right]^{1/\beta} F_3(X, Z) dXdZ
\end{aligned} \tag{2.23}$$

$$\frac{\bar{z}_{sg}}{c} = \frac{1}{A_{sg/a}^2} \left(\frac{b}{a}\right) \iint_{R_{XY}} \left[1 - X^a - Y^\beta\right]^{1/\gamma} F_1(X, Y) dXdY$$

$$\begin{aligned}
&= \frac{1}{A_{sg/a}^2} \left(\frac{b}{a}\right) \left(\frac{c}{a}\right) \iint_{R_{YZ}} Z F_2(Y, Z) dYdZ \\
&= \frac{1}{A_{sg/a}^2} \left(\frac{c}{a}\right) \iint_{R_{XZ}} Z F_3(X, Z) dXdZ \tag{2.24}
\end{aligned}$$

MOMENTS OF INERTIA

$$\begin{aligned}
\frac{I_{xysg}}{\rho ta^4} &= \left(\frac{c}{a}\right)^2 \left(\frac{b}{a}\right) \iint_{R_{XY}} \left[1 - X^a - Y^\beta\right]^{2/\gamma} F_1(X, Y) dXdY \\
&= \left(\frac{c}{a}\right)^3 \left(\frac{b}{a}\right) \iint_{R_{YZ}} Z^2 F_2(Y, Z) dYdZ \\
&= \left(\frac{c}{a}\right)^3 \iint_{R_{XZ}} Z^2 F_3(X, Z) dXdZ \tag{2.25}
\end{aligned}$$

$$\begin{aligned}
\frac{I_{yzsg}}{\rho ta^4} &= \left(\frac{b}{a}\right) \iint_{R_{XY}} X^2 F_1(X, Y) dXdY \\
&= \left(\frac{b}{a}\right) \left(\frac{c}{a}\right) \iint_{R_{YZ}} \left[1 - Y^\beta - Z^\gamma\right]^{2/a} F_2(Y, Z) dYdZ \\
&= \left(\frac{c}{a}\right) \iint_{R_{XZ}} X^2 F_3(X, Z) dXdZ \tag{2.26}
\end{aligned}$$

$$\frac{I_{zxs g}}{\rho ta^4} = \left(\frac{b}{a}\right)^3 \iint_{R_{XY}} Y^2 F_1(X, Y) dXdY$$

$$\begin{aligned}
&= \left(\frac{b}{a}\right)^3 \left(\frac{c}{a}\right) \iint_{R_{YZ}} Y^2 F_2(Y, Z) dYdZ \\
&= \left(\frac{b}{a}\right)^2 \left(\frac{c}{a}\right) \iint_{R_{XZ}} \left[1 - X^a - Z^\gamma\right]^{2/\beta} F_3(X, Z) dXdZ
\end{aligned} \tag{2.27}$$

where the dimensionless functions are

$$\begin{aligned}
F_1(X, Y) = & \left\{ 1 + \left(\left(\frac{c}{a} \frac{a}{\gamma}\right) X^{a-1} \left[1 - X^a - Y^\beta\right]^{(1-\gamma)/\gamma} \right)^2 \right. \\
& \left. + \left(\left(\frac{c}{b} \frac{\beta}{\gamma}\right) Y^{\beta-1} \left[1 - X^a - Y^\beta\right]^{(1-\gamma)/\gamma} \right)^2 \right\}^{1/2}
\end{aligned} \tag{2.28}$$

$$\begin{aligned}
F_2(Y, Z) = & \left\{ 1 + \left(\left(\frac{a}{b} \frac{\beta}{a}\right) Y^{\beta-1} \left[1 - Y^\beta - Z^\gamma\right]^{(1-a)/a} \right)^2 \right. \\
& \left. + \left(\left(\frac{a}{c} \frac{\gamma}{a}\right) Z^{\gamma-1} \left[1 - Y^\beta - Z^\gamma\right]^{(1-a)/a} \right)^2 \right\}^{1/2}
\end{aligned} \tag{2.29}$$

$$\begin{aligned}
F_3(X, Z) = & \left\{ 1 + \left(\left(\frac{b}{a} \frac{a}{\beta}\right) X^{a-1} \left[1 - X^a - Z^\gamma\right]^{(1-\beta)/\beta} \right)^2 \right. \\
& \left. + \left(\left(\frac{b}{c} \frac{\gamma}{\beta}\right) Z^{\gamma-1} \left[1 - X^a - Z^\gamma\right]^{(1-\beta)/\beta} \right)^2 \right\}^{1/2}
\end{aligned} \tag{2.30}$$

NUMERICAL INTEGRATION

1. Gaussian Quadrature Rule

The Gaussian quadrature rule is used to compute the numerical solution of the integrals. This rule, of order n on the interval $[-1, 1]$, is given as

$$\int_{-1}^1 f(x) dx \doteq \sum_{k=1}^n w_k f(x_k) \quad (2.31)$$

The abscissas x_k ($k = 1, 2, \dots, n$) are the n zeros of the Legendre polynomial of order n : $P_n(x_k) = 0$. The weights, w_k , are given by the expression

$$w_k = \frac{2(1 - x_k^2)}{[n P_{n-1}(x_k)]^2} \quad (2.32)$$

The weights and abscissas for the Gaussian quadrature rules of order $n = 16, 20, 24, 32, 40, 48, 64, 80$ and 96 are given by Davis and Rabinowitz [7, 8].

In general, if the integral over the interval r, s is required, a simple transformation may reduce the interval r, s to $[-1, 1]$, i.e.

$$\begin{aligned} \int_r^s f(x) dx &= \frac{1}{2}(s-r) \int_{-1}^1 f \left[\frac{1}{2}(s-r)x + \frac{1}{2}(s+r) \right] dx \\ &\doteq \frac{1}{2}(s-r) \sum_{i=1}^n w_i f \left[\frac{1}{2}(s-r)x_i + \frac{1}{2}(s+r) \right] \end{aligned} \quad (2.33)$$

Since the abscissas and the weights are symmetrical about $x = 0$, Eq.(2.33) may be written as

$$\begin{aligned} \int_r^s f(x) dx &\doteq \frac{1}{2}(s-r) \sum_{i=1}^{n/2} w_i \left\{ f \left[\frac{1}{2}(s-r)x_i + \frac{1}{2}(s+r) \right] \right. \\ &\quad \left. + f \left[-\frac{1}{2}(s-r)x_i + \frac{1}{2}(s+r) \right] \right\} \end{aligned} \quad (2.34)$$

Using the Gaussian quadrature rule, a double integral can be approximated similarly, as follows.

$$\begin{aligned}
 \phi &= \int_r^s g(x) \int_{c(x)}^{d(x)} f(x, y) dy dx \\
 &\doteq \frac{1}{2}(s-r) \sum_{i=1}^{n/2} w_i \left\{ g \left[\frac{s-r}{2} x_i + \frac{s+r}{2} \right] \int_{c\left(\frac{s-r}{2} x_i + \frac{s+r}{2}\right)}^{d\left(\frac{s-r}{2} x_i + \frac{s+r}{2}\right)} f\left(\frac{s-r}{2} x_i + \frac{s+r}{2}, y\right) dy \right. \\
 &\quad \left. + g \left[-\frac{s-r}{2} x_i + \frac{s+r}{2} \right] \int_{c\left(-\frac{s-r}{2} x_i + \frac{s+r}{2}\right)}^{d\left(-\frac{s-r}{2} x_i + \frac{s+r}{2}\right)} f\left(-\frac{s-r}{2} x_i + \frac{s+r}{2}, y\right) dy \right\} \quad (2.35)
 \end{aligned}$$

Let $u_i = \frac{s-r}{2} x_i + \frac{s+r}{2}$

$$v_i = -\frac{s-r}{2} x_i + \frac{s+r}{2}$$

$$\phi = \frac{1}{2}(s-r) \sum_{i=1}^{n/2} w_i \left\{ g(u_i) \int_{c(u_i)}^{d(u_i)} f(u_i, y) dy + g(v_i) \int_{c(v_i)}^{d(v_i)} f(v_i, y) dy \right\}$$

$$\begin{aligned}
&= \frac{1}{2}(s-r) \sum_{i=1}^{n/2} w_i \left\{ g(u_i) \frac{d(u_i) - c(u_i)}{2} \left[\sum_{j=1}^{n/2} w_j \left\{ f(u_i, \frac{d(u_i) - c(u_i)}{2} y_j \right. \right. \right. \\
&+ \left. \left. \left. \frac{d(u_i) + c(u_i)}{2} \right) + f(u_i, -\frac{d(u_i) - c(u_i)}{2} y_j + \frac{d(u_i) + c(u_i)}{2} \right) \right] \right\} \\
&+ g(v_i) \frac{d(v_i) - c(v_i)}{2} \left[\sum_{j=1}^{n/2} w_j \left\{ f(v_i, \frac{d(v_i) - c(v_i)}{2} y_j + \frac{d(v_i) + c(v_i)}{2} \right) \right. \\
&+ \left. \left. \left. f(v_i, -\frac{d(v_i) - c(v_i)}{2} y_j + \frac{d(v_i) + c(v_i)}{2} \right) \right] \right\} \quad (2.36)
\end{aligned}$$

2. Evaluation of the Integrals

The Gaussian quadrature rule of order n on the interval $[-1, 1]$ yields exact results whenever the integrand, f , is a polynomial of degree $\leq (2n-1)$. There is an error if f is different from the polynomial. The error is dependent on the nature of the function f . The functions F_1 , F_2 and F_3 of Eqs. (2.28), (2.29) and (2.30) are in terms of the slopes of the surface. By the nature of the functions and from an investigation of the shape of the surface, it can be concluded that values of the functions are zero, constant or unbounded along the edges depending on whether the exponential constants (a , β , γ) are greater than one, equal to one or less than one. This corresponds to the slope of the end points for the two dimensional curve which is mentioned in the first report, [4].

Due to the unbounded value of the function along the edges, a large per cent error is introduced when either the Gaussian quadrature rule or Simpson's rule is used in the calculation of the integrals. To increase the accuracy and to obtain better computer performance, the first octant surface of Eq.(2.3) was divided into several parts and integrated over different coordinate planes depending on the nature of the surface. The governing features were the values of the exponential constants, a , β , and γ . Therefore each combination of a , β and γ was investigated carefully before the integrations were performed on the computer.

In order to perform the integration, the range of each of the exponents a , β or γ was separated into two regions; (1) the exponent less than one, (2) the exponent equal to or greater than one. Thus eight combinations exist as tabulated below.

Group	a	β	γ
(1)	≥ 1	≥ 1	≥ 1
(2)	< 1	< 1	≥ 1
(3)	< 1	≥ 1	< 1
(4)	≥ 1	< 1	< 1
(5)	≥ 1	≥ 1	< 1
(6)	≥ 1	< 1	≥ 1
(7)	< 1	≥ 1	≥ 1
(8)	< 1	< 1	< 1

The integration for each of the above tabulated groups is discussed below.

(a) For $a \geq 1$, $\beta \geq 1$, $\gamma \geq 1$

A typical surface shape for this group appears in Fig. 1. Referring to Eqs. (2.8), (2.10), and (2.11), the values of the functions become infinite on the planes identified by $z = 0$, $y = 0$ or $x = 0$ respectively. Therefore if the numerical integration is carried out over the entire domain on the xy , yz or zx plane, a large error will be introduced. In order to reduce the error, the surface is divided into several regions, which are integrated relative to the different planes. For this group, the first octant, Fig. 4, is divided into three regions. The first region is integrated over the yz -plane, with the surface area as Eq. (2.9)

$$A_1 = \int_0^{z_1} \int_0^{f_1(z)} H(y, z) dy dz \quad (2.37)$$

where $f_1(z)$ is the value of y in terms of z on the plane $x = x_1$, i. e.

$$\left| \frac{x_1}{a} \right|^a + \left| \frac{y}{b} \right|^\beta + \left| \frac{z}{c} \right|^\gamma = 1$$

Thus

$$f_1(z) = y = b \left[1 - \left| \frac{x_1}{a} \right|^a - \left| \frac{z}{c} \right|^\gamma \right]^{1/\beta} \quad (2.38)$$

For the second region, x and y are chosen as the independent variables.

From Eq.(2.7) the surface area is then

$$A_2 = \int_0^{x_1} \int_0^{y_2} F(x, y) dy dx \quad (2.39)$$

where both x_1 and y_2 are constants.

For the third region, x and z are chosen as the independent variables. From Eq.(2.9), the area is

$$A_3 = \int_0^{x_1} \int_0^{f_2(x)} G(x, z) dz dx \quad (2.40)$$

where $f_2(x)$ is the value of z in terms of x at $y = y_2$, i.e.

$$f_2(x) = z = c \left[1 - \left| \frac{y_2}{b} \right|^\beta - \left| \frac{x}{a} \right|^a \right]^{1/\gamma} \quad (2.41)$$

The total surface area of the first octant is therefore

$$A_{sg} = A_1 + A_2 + A_3 \quad (2.42)$$

The coordinates of the centroid are calculated in like manner.

For the first region

$$\begin{aligned} A_1 \bar{x}_1 &= \int_0^{z_1} \int_0^{f_1(z)} a \left[1 - \left| \frac{y}{b} \right|^\beta - \left| \frac{z}{c} \right|^\gamma \right]^{1/a} H(y, z) dy dz \\ A_1 \bar{y}_1 &= \int_0^{z_1} \int_0^{f_1(z)} y H(y, z) dy dz \end{aligned} \quad (2.43)$$

$$A_1 \bar{z}_1 = \int_0^{z_1} \int_0^{f_1(z)} z H(y, z) dy dz$$

For the second region

$$A_2 \bar{x}_2 = \int_0^{x_1} \int_0^{y_2} x F(x, y) dy dx$$

$$A_2 \bar{y}_2 = \int_0^{x_1} \int_0^{y_2} y F(x, y) dy dx$$

$$A_2 \bar{z}_2 = \int_0^{x_1} \int_0^{y_2} c \left[1 - \left| \frac{x}{a} \right|^a - \left| \frac{y}{b} \right|^\beta \right]^{1/\gamma} F(x, y) dy dx$$

(2.44)

For the third region

$$A_3 \bar{x}_3 = \int_0^{x_1} \int_0^{f_2(x)} x G(x, z) dz dx$$

$$A_3 \bar{y}_3 = \int_0^{x_1} \int_0^{f_2(x)} b \left[1 - \left| \frac{x}{a} \right|^a - \left| \frac{z}{c} \right|^\gamma \right]^{1/\beta} G(x, z) dz dx$$

$$A_3 \bar{z}_3 = \int_0^{x_1} \int_0^{f_2(x)} z G(x, z) dz dx$$

(2.45)

The coordinates of the centroid of the complete shell in the first octant are thus

$$\bar{x}_{sg} = \frac{A_1 \bar{x}_1 + A_2 \bar{x}_2 + A_3 \bar{x}_3}{A}$$

$$\left. \begin{aligned} \bar{y}_{sg} &= \frac{A_1 \bar{y}_1 + A_2 \bar{y}_2 + A_3 \bar{y}_3}{A} \\ \bar{z}_{sg} &= \frac{A_1 \bar{z}_1 + A_2 \bar{z}_2 + A_3 \bar{z}_3}{A} \end{aligned} \right\} \quad (2.46)$$

The calculation of the moments of inertia, is also performed using the above three regions. Equations (2.17), (2.18) and (2.19) can be used with the region as for the area integrals. The total moment of inertia is the sum of values obtained for the three regions.

(b) For $a < 1, \beta < 1, \gamma \geq 1$; $a < 1, \beta \geq 1, \gamma < 1$; $a \geq 1, \beta < 1, \gamma < 1$

A typical surface shape for this group appears in Fig. 2. Here the first octant surface is divided into two regions which are integrated over two different planes depending on the values of a, β , and γ . The configuration for $a < 1, \beta \geq 1, \gamma < 1$, appears in Fig. 5. The first octant surface is cut into two regions by the plane $\frac{x}{a} = \frac{z}{c}$, region 1, is integrated over the yz -plane while region 2 is integrated over the xy -plane, the surface area for region 1 is

$$A_1 = \int_0^{z_1} \int_{f_1(z)}^{f_2(z)} H(y, z) dy dz + \int_{z_1}^c \int_0^{f_2(z)} H(y, z) dy dz \quad (2.47)$$

while the surface area for region 2 is

$$A_2 = \int_0^{x_1} \int_{g_1(x)}^{g_2(x)} F(x, y) dy dx + \int_{x_1}^a \int_0^{g_2(x)} F(x, y) dy dx \quad (2.48)$$

where

$$\left. \begin{aligned} f_1(z) &= b \left[1 - \left| \frac{z}{c} \right|^a - \left| \frac{z}{c} \right|^\gamma \right]^{1/\beta} \\ f_2(z) &= b \left[1 - \left| \frac{z}{c} \right|^\gamma \right]^{1/\beta} \\ g_1(x) &= b \left[1 - \left| \frac{x}{a} \right|^a - \left| \frac{x}{a} \right|^\gamma \right]^{1/\beta} \end{aligned} \right\} \quad (2.49)$$

$$g_2(x) = b \left[1 - \left| \frac{x}{a} \right|^a \right]^{1/\beta}$$

The values x_1 and z_1 , satisfying the condition $\frac{x_1}{a} = \frac{z_1}{c}$, are the roots of the equations

$$\left| \frac{x}{a} \right|^a + \left| \frac{x}{a} \right|^\gamma = 1$$

and

$$\left| \frac{z}{c} \right|^a + \left| \frac{z}{c} \right|^\gamma = 1$$

(2.50)

For the moments of inertia and coordinates of the centroid of shells the evaluations can be performed by summing these two pieces, as discussed in (a).

(c) For $a \geq 1$, $\beta \geq 1$, $\gamma < 1$; $a \geq 1$, $\beta < 1$, $\gamma \geq 1$; $a < 1$, $\beta \geq 1$, $\gamma \geq 1$

A typical shape for these groups appears in Fig. 3. One of the functions, Eqs. (2.8), (2.10), (2.11), will not become infinite at the plane $x = 0$, $y = 0$, or $z = 0$. Therefore, the integration may be performed with good accuracy by choosing the suitable independent variables without dividing the surface into separate regions. For the case $a > 1$, $\beta < 1$, $\gamma > 1$, Fig. 6, x and z are treated as independent variables, and the integration is performed over the domain on the zx -plane. The surface area is then

$$A = \int_0^a \int_0^{f_1(x)} G(x, z) dz dx \quad (2.51)$$

where $f_1(x) = c \left[1 - \left| \frac{x}{a} \right|^a \right]^{1/\gamma}$

Similarly, the coordinates of the centroid and the moments of inertia can be integrated over the same domain.

(d) For $a < 1$, $\beta < 1$, $\gamma < 1$

The shells generated by this group are evaluated as described above under (b).

TABULATED RESULTS

1. Range of Values of a , β and γ

Representative three dimensional configurations were selected using the thirty-five combinations of the exponents resulting from values of 0.5, 1.4, 2, 3, 5 and 10 for a , β and γ . Of these possible combinations, thirty-two were selected as indicated

a	β	γ	a	β	γ
.5	.5	2	1.4	2	5
.5	.5	3	1.4	3	3
.5	1.4	1.4	1.4	3	5
.5	1.4	2	1.4	5	5
.5	1.4	3	2	2	2
.5	2	2	2	2	3
.5	2	3	2	2	5
.5	3	3	2	3	3
.5	3	5	2	3	5
.5	5	5	2	5	5
1.4	1.4	1.4	3	3	3
1.4	1.4	2	3	3	5
1.4	1.4	3	3	5	5
1.4	1.4	5	5	5	5
1.4	2	2	5	5	10
1.4	2	3	10	10	10

2. Range of Values of b/a and c/a

The following combinations of b/a and c/a were selected.

b/a	c/a	b/a	c/a
.1	.1	1	.1
.25	.2	1	.2
.5	.25	1	1
.5	.5	1	2

The first two shell shapes correspond to the prolate spheroid, the fifth and sixth correspond to the oblate spheroid while the seventh correspond to the spherical shape when a , β and γ are near 2.

3. Floating Point Notation

With the exception of the values of b/a , c/a , a , β and γ , the values in Table I are in floating point notation as follows :

$$\begin{aligned} .12315\ 02 &= 12.315 \\ .12315\ 00 &= .12315 \\ .12315-01 &= .012315 \end{aligned}$$

4. Discussion of Tables I and II

The printed results in Table I appear in dimensionless form with the following headings :

$$\frac{b}{a} \quad \frac{c}{a} \quad \frac{A_{sg}}{a^2} \quad \frac{\bar{x}_{sg}}{a} \quad \frac{\bar{y}_{sg}}{b} \quad \frac{\bar{z}_{sg}}{c} \quad \frac{I_{xsg}}{\rho t a^4} \quad \frac{I_{ysg}}{\rho t a^4} \quad \frac{I_{zsg}}{\rho t a^4} \quad a \quad \beta \quad \gamma$$

Note that the thickness of the shell has been assumed small compared to a , b and c and thus neglected in obtaining the reported values. Shells with one or more of the exponents less than one would be expected to have greater errors due to neglecting the thickness.

Table II presents values of x/a and y/b for fifteen values of z/c with b/a and c/a equal to unity. Other values of b/a and c/a can be achieved by linear changes in the numerical values presented in the table.

5. Discussion of Tables III and IV

The volumes, coordinates of centroids and moments of inertia of general solids in the first octant bounded by Eq. (2.3) appear in Table III, for various combinations of a , β and γ . The values of $\frac{b}{a}$ and $\frac{c}{a}$ were chosen as in Table I. The formulas and the heading notations appear in Appendixes A and B.

Table IV presents the areas, centroids and moments of inertia of areas as well as volumes, centroids of volumes and moments of inertia of bodies of revolution of areas bounded by the first quadrant of $\left|\frac{x}{a}\right|^a + \left|\frac{y}{b}\right|^\beta = 1$. The mathematical formulas and notations of this table are in Appendixes A, B, and C of [4]. The values in the table appear in dimensionless form and are independent of the values $\frac{b}{a}$.

TABLE I GEOMETRICAL AND INERTIAL CHARACTERISTICS OF THIN SHELLS

$\frac{b}{a}$	$\frac{c}{a}$	$\frac{A_{sg}}{a^2}$	$\frac{\bar{x}_{sg}}{a}$	$\frac{\bar{y}_{sg}}{b}$	$\frac{\bar{z}_{sg}}{c}$	$\frac{I_{xsg}}{\rho ta^4}$	$\frac{I_{ysg}}{\rho ta^4}$	$\frac{I_{zsg}}{\rho ta^4}$	
.10	.10	.58654-01	.35654 00	.14344 00	.32204 00	.11818-03	.11603-01	.11547-01	$\alpha = 0.50$ $\beta = 0.50$ $\gamma = 2.00$
.25	.20	.12768 00	.33428 00	.16618 00	.32449 00	.13185-02	.24006-01	.23789-01	
.50	.25	.19470 00	.29334 00	.20134 00	.33192 00	.63743-02	.31909-01	.34510-01	
.50	.50	.34823 00	.30882 00	.20177 00	.31891 00	.21124-01	.70973-01	.66518-01	
1.00	.10	.20021 00	.21873 00	.21873 00	.37793 00	.18940-01	.18940-01	.37145-01	
1.00	.20	.25841 00	.23443 00	.23443 00	.35348 00	.30121-01	.30121-01	.56761-01	
1.00	1.00	.89102 00	.25778 00	.25778 00	.31639 00	.24919 00	.24919 00	.23941 00	
1.00	2.00	.17444 01	.25956 00	.25956 00	.31353 00	.12389 01	.12389 01	.47508 00	
.10	.10	.70212-01	.38940 00	.15375 00	.36559 00	.17197-03	.16097-01	.16008-01	$\alpha = 0.50$ $\beta = 0.50$ $\gamma = 3.00$
.25	.20	.15251 00	.36495 00	.17842 00	.36958 00	.18983-02	.33318-01	.32912-01	
.50	.25	.23075 00	.32176 00	.21629 00	.38161 00	.89358-02	.44147-01	.47354-01	
.50	.50	.41807 00	.33653 00	.21890 00	.36057 00	.30478-01	.99661-01	.92191-01	
1.00	.10	.21937 00	.23139 00	.23139 00	.46304 00	.23657-01	.23657-01	.46162-01	
1.00	.20	.29706 00	.25217 00	.25217 00	.41761 00	.40315-01	.40315-01	.75227-01	
1.00	1.00	.10717 01	.28067 00	.28067 00	.35646 00	.35701 00	.35701 00	.33213 00	
1.00	2.00	.21016 01	.28290 00	.28290 00	.35172 00	.17952 01	.17952 01	.66041 00	
.10	.10	.63681-01	.34005 00	.32401 00	.32401 00	.19352-03	.11381-01	.11381-01	$\alpha = 0.50$ $\beta = 1.40$ $\gamma = 1.40$
.25	.20	.14849 00	.33329 00	.32051 00	.33615 00	.23609-02	.26719-01	.27159-01	
.50	.25	.26618 00	.32644 00	.31227 00	.35318 00	.12651-01	.48060-01	.54906-01	
.50	.50	.36753 00	.31358 00	.34046 00	.34046 00	.30964-01	.75173-01	.75173-01	
1.00	.10	.44233 00	.33759 00	.28590 00	.36654 00	.56154-01	.78581-01	.13314 00	
1.00	.20	.47162 00	.32865 00	.29768 00	.36559 00	.67403-01	.84025-01	.14456 00	
1.00	1.00	.94453 00	.28447 00	.35789 00	.35789 00	.35084 00	.31309 00	.31309 00	
1.00	2.00	.16998 01	.27401 00	.37241 00	.35575 00	.16019 01	.15042 01	.57258 00	
.10	.10	.74082-01	.36321 00	.34149 00	.37669 00	.26841-03	.14815-01	.14795-01	$\alpha = 0.50$ $\beta = 1.40$ $\gamma = 2.00$
.25	.20	.16908 00	.35430 00	.33781 00	.39200 00	.31600-02	.33879-01	.34218-01	
.50	.25	.29163 00	.34182 00	.32819 00	.41864 00	.15890-01	.57580-01	.65095-01	
.50	.50	.42124 00	.34176 00	.35991 00	.38369 00	.41074-01	.99997-01	.98077-01	
1.00	.10	.45032 00	.33940 00	.29110 00	.46539 00	.59783-01	.81187-01	.13860 00	
1.00	.20	.49200 00	.33491 00	.30858 00	.45038 00	.76751-01	.91852-01	.15864 00	
1.00	1.00	.10669 01	.31781 00	.38022 00	.39090 00	.44783 00	.41213 00	.40557 00	
1.00	2.00	.19430 01	.31425 00	.39571 00	.37852 00	.20144 01	.19240 01	.76189 00	
.10	.10	.86475-01	.38796 00	.35625 00	.42913 00	.36843-03	.19379-01	.19321-01	$\alpha = 0.50$ $\beta = 1.40$ $\gamma = 3.00$
.25	.20	.19440 00	.37779 00	.35275 00	.44678 00	.42144-02	.43662-01	.43787-01	
.50	.25	.32544 00	.36117 00	.34288 00	.48123 00	.20101-01	.71410-01	.79561-01	
.50	.50	.48484 00	.37075 00	.37570 00	.42879 00	.54318-01	.13310 00	.12740 00	
1.00	.10	.46586 00	.34376 00	.29819 00	.56485 00	.65398-01	.86550-01	.14855 00	
1.00	.20	.52447 00	.34530 00	.32045 00	.53231 00	.89400-01	.10494 00	.18017 00	
1.00	1.00	.12070 01	.35130 00	.39837 00	.42694 00	.56965 00	.54331 00	.51607 00	
1.00	2.00	.22033 01	.35265 00	.41521 00	.40576 00	.25396 01	.24688 01	.98081 00	
.10	.10	.84386-01	.37971 00	.39862 00	.39862 00	.36323-03	.18122-01	.18122-01	$\alpha = 0.50$ $\beta = 2.00$ $\gamma = 2.00$
.25	.20	.19493 00	.37657 00	.38667 00	.41433 00	.42984-02	.43001-01	.43734-01	
.50	.25	.34324 00	.37326 00	.36516 00	.44057 00	.21663-01	.77571-01	.88499-01	
.50	.50	.47290 00	.36760 00	.40550 00	.40550 00	.53036-01	.12516 00	.12516 00	
1.00	.10	.55319 00	.37812 00	.32211 00	.48269 00	.85762-01	.11886 00	.20152 00	
1.00	.20	.59426 00	.37385 00	.33759 00	.47006 00	.10560 00	.13163 00	.22427 00	
1.00	1.00	.11793 01	.35421 00	.41295 00	.41295 00	.55270 00	.51797 00	.51797 00	
1.00	2.00	.20942 01	.34917 00	.43292 00	.39880 00	.24095 01	.23093 01	.95314 00	
.10	.10	.96762-01	.39981 00	.41719 00	.45428 00	.48678-03	.22689-01	.22651-01	$\alpha = 0.50$ $\beta = 2.00$ $\gamma = 3.00$
.25	.20	.22015 00	.39606 00	.40482 00	.47241 00	.56029-02	.53155-01	.53686-01	
.50	.25	.37674 00	.39010 00	.38134 00	.50658 00	.26799-01	.92823-01	.10460 00	
.50	.50	.53581 00	.39556 00	.42323 00	.45222 00	.68578-01	.16201 00	.15803 00	
1.00	.10	.56846 00	.38223 00	.32830 00	.58295 00	.92089-01	.12521 00	.21292 00	
1.00	.20	.62616 00	.38395 00	.34834 00	.55455 00	.11992 00	.14727 00	.24911 00	
1.00	1.00	.13130 01	.39133 00	.43081 00	.44850 00	.68481 00	.66796 00	.64555 00	
1.00	2.00	.23360 01	.39329 00	.45249 00	.42292 00	.29379 01	.28754 01	.12048 01	
.10	.10	.10907 00	.41606 00	.47616 00	.47616 00	.63772-03	.27291-01	.27291-01	$\alpha = 0.50$ $\beta = 3.00$ $\gamma = 3.00$
.25	.20	.25070 00	.41784 00	.45672 00	.49336 00	.74040-02	.65975-01	.67187-01	
.50	.25	.43562 00	.41987 00	.42304 00	.52592 00	.35818-01	.12026 00	.13762 00	
.50	.50	.59937 00	.42323 00	.47147 00	.47147 00	.86977-01	.20027 00	.20027 00	
1.00	.10	.67850 00	.41726 00	.36399 00	.59696 00	.12970 00	.17212 00	.29638 00	
1.00	.20	.73721 00	.41982 00	.38236 00	.57138 00	.16279 00	.19902 00	.33943 00	
1.00	1.00	.14447 01	.43225 00	.46608 00	.46608 00	.83131 00	.81975 00	.81975 00	
1.00	2.00	.25146 01	.43619 00	.49109 00	.43713 00	.34183 01	.33582 01	.15069 01	

TABLE I GEOMETRICAL AND INERTIAL CHARACTERISTICS OF THIN SHELLS

$\frac{b}{a}$	$\frac{c}{a}$	$\frac{A_{sg}}{a^2}$	$\frac{\bar{x}_{sg}}{a}$	$\frac{\bar{y}_{sg}}{b}$	$\frac{\bar{z}_{sg}}{c}$	$\frac{I_{xsg}}{\rho ta^4}$	$\frac{I_{ysg}}{\rho ta^4}$	$\frac{I_{zsg}}{\rho ta^4}$	
.10	.10	.12340 00	.43422 00	.49456 00	.53680 00	.83216-03	.33227-01	.33161-01	$\alpha=0.50$ $\beta=3.00$ $\gamma=5.00$
.25	.20	.28101 00	.43661 00	.47426 00	.55576 00	.94485-02	.80218-01	.81032-01	
.50	.25	.47860 00	.43801 00	.43847 00	.59453 00	.43730-01	.14385 00	.16219 00	
.50	.50	.67551 00	.45059 00	.48675 00	.52439 00	.11112 00	.25526 00	.24743 00	
1.00	.10	.70285 00	.42417 00	.37081 00	.69676 00	.14005 00	.18475 00	.31738 00	
1.00	.20	.78309 00	.43343 00	.39266 00	.65584 00	.18439 00	.22661 00	.38050 00	
1.00	1.00	.16048 01	.47060 00	.47967 00	.50844 00	.10249 01	.10528 01	.99799 00	
1.00	2.00	.27782 01	.48232 00	.50679 00	.46667 00	.41659 01	.41852 01	.18447 01	
.10	.10	.13755 00	.45042 00	.55738 00	.55738 00	.10620-02	.39356-01	.39356-01	$\alpha=0.50$ $\beta=5.00$ $\gamma=5.00$
.25	.20	.31668 00	.45824 00	.53093 00	.57419 00	.12222-01	.97830-01	.99813-01	
.50	.25	.54668 00	.46635 00	.48677 00	.61031 00	.57851-01	.18112 00	.20875 00	
.50	.50	.75466 00	.47878 00	.54037 00	.54037 00	.13955 00	.31157 00	.31157 00	
1.00	.10	.82125 00	.45605 00	.41267 00	.70712 00	.19604 00	.24248 00	.42963 00	
1.00	.20	.90605 00	.46651 00	.43374 00	.66885 00	.25045 00	.29356 00	.50759 00	
1.00	1.00	.17721 01	.51216 00	.52197 00	.52197 00	.12465 01	.12708 01	.12708 01	
1.00	2.00	.30135 01	.52821 00	.55152 00	.47637 00	.48180 01	.48296 01	.23213 01	
.10	.10	.96493-01	.38437 00	.44225 00	.44225 00	.51245-03	.20667-01	.20667-01	$\alpha=1.40$ $\beta=1.40$ $\gamma=1.40$
.25	.20	.22057 00	.38685 00	.42956 00	.45241 00	.59255-02	.44615-01	.50694-01	
.50	.25	.38732 00	.39011 00	.40825 00	.47078 00	.29732-01	.91135-01	.10678 00	
.50	.50	.51372 00	.39761 00	.43539 00	.43539 00	.66634-01	.14855 00	.14856 00	
1.00	.10	.66543 00	.38525 00	.38525 00	.50023 00	.14344 00	.16344 00	.28267 00	
1.00	.20	.69085 00	.38913 00	.38913 00	.49188 00	.15787 00	.15787 00	.29867 00	
1.00	1.00	.11919 01	.42269 00	.42269 00	.42269 00	.59082 00	.59082 00	.59082 00	
1.00	2.00	.20549 01	.43539 00	.43539 00	.39761 00	.23769 01	.23769 01	.10661 01	
.10	.10	.10555 00	.39975 00	.46759 00	.48524 00	.63659-03	.24278-01	.24261-01	$\alpha=1.40$ $\beta=1.40$ $\gamma=2.00$
.25	.20	.23965 00	.40076 00	.45226 00	.50028 00	.72843-02	.57766-01	.58845-01	
.50	.25	.41381 00	.40142 00	.42499 00	.52907 00	.35233-01	.10382 00	.12088 00	
.50	.50	.56493 00	.41660 00	.45968 00	.47501 00	.82780-01	.18027 00	.17842 00	
1.00	.10	.67488 00	.38814 00	.38814 00	.58724 00	.14814 00	.14814 00	.29085 00	
1.00	.20	.71523 00	.39629 00	.39629 00	.56762 00	.17113 00	.17113 00	.32020 00	
1.00	1.00	.13188 01	.44660 00	.44660 00	.45689 00	.73326 00	.73326 00	.72248 00	
1.00	2.00	.22833 01	.46402 00	.46402 00	.42147 00	.29182 01	.29182 01	.13272 01	
.10	.10	.11600 00	.41511 00	.49072 00	.52718 00	.78631-03	.28594-01	.28551-01	$\alpha=1.40$ $\beta=1.40$ $\gamma=3.00$
.25	.20	.26225 00	.41514 00	.47365 00	.54582 00	.89258-02	.67745-01	.68771-01	
.50	.25	.44714 00	.41407 00	.44230 00	.58258 00	.41969-01	.12004 00	.13888 00	
.50	.50	.62322 00	.43466 00	.48172 00	.51449 00	.10225 00	.21803 00	.21298 00	
1.00	.10	.69199 00	.39302 00	.39302 00	.66966 00	.15623 00	.15623 00	.30556 00	
1.00	.20	.75103 00	.40574 00	.40574 00	.63678 00	.18990 00	.18990 00	.35172 00	
1.00	1.00	.14595 01	.46815 00	.46815 00	.49238 00	.90430 00	.90430 00	.87072 00	
1.00	2.00	.25224 01	.48929 00	.48929 00	.44838 00	.35740 01	.35740 01	.16110 01	
.10	.10	.12803 00	.42954 00	.51129 00	.57165 00	.97067-03	.33606-01	.33518-01	$\alpha=1.40$ $\beta=1.40$ $\gamma=5.00$
.25	.20	.28855 00	.42898 00	.49316 00	.59293 00	.10930-01	.79555-01	.80393-01	
.50	.25	.48708 00	.42694 00	.45917 00	.63556 00	.50192-01	.13979 00	.16049 00	
.50	.50	.68973 00	.45107 00	.50115 00	.55721 00	.12626 00	.26303 00	.25226 00	
1.00	.10	.71663 00	.39958 00	.39958 00	.74829 00	.16769 00	.16769 00	.32670 00	
1.00	.20	.79727 00	.41654 00	.41654 00	.70249 00	.21394 00	.21394 00	.39234 00	
1.00	1.00	.16179 01	.48698 00	.48698 00	.53209 00	.11152 01	.11152 01	.10362 01	
1.00	2.00	.27804 01	.51104 00	.51104 00	.48035 00	.44060 01	.44060 01	.19187 01	
.10	.10	.11470 00	.41280 00	.50973 00	.50973 00	.77531-03	.27906-01	.27906-01	$\alpha=1.40$ $\beta=2.00$ $\gamma=2.00$
.25	.20	.26256 00	.41749 00	.48884 00	.52542 00	.89194-02	.68079-01	.69569-01	
.50	.25	.45736 00	.42355 00	.45326 00	.55569 00	.43088-01	.12611 00	.14728 00	
.50	.50	.61754 00	.43515 00	.49732 00	.49732 00	.10066 00	.21358 00	.21358 00	
1.00	.10	.74817 00	.41544 00	.40654 00	.61780 00	.17675 00	.18497 00	.35512 00	
1.00	.20	.79266 00	.42294 00	.41662 00	.59696 00	.20572 00	.21237 00	.39131 00	
1.00	1.00	.14452 01	.47154 00	.47828 00	.47828 00	.88696 00	.88080 00	.88080 00	
1.00	2.00	.24813 01	.49007 00	.50031 00	.43834 00	.34513 01	.34324 01	.16140 01	
.10	.10	.12510 00	.42666 00	.53176 00	.55029 00	.93802-03	.32305-01	.32278-01	$\alpha=1.40$ $\beta=2.00$ $\gamma=3.00$
.25	.20	.28528 00	.43093 00	.50915 00	.56870 00	.10708-01	.78681-01	.80142-01	
.50	.25	.49133 00	.43579 00	.46987 00	.60556 00	.50513-01	.14409 00	.16734 00	
.50	.50	.67674 00	.45339 00	.51707 00	.53453 00	.12168 00	.25524 00	.25199 00	
1.00	.10	.76609 00	.42022 00	.41152 00	.69431 00	.18598 00	.19431 00	.37212 00	
1.00	.20	.82965 00	.43235 00	.42986 00	.66093 00	.22659 00	.23390 00	.42729 00	
1.00	1.00	.15845 01	.49437 00	.49713 00	.51118 00	.10675 01	.10683 01	.10446 01	
1.00	2.00	.27133 01	.51711 00	.52229 00	.46306 00	.41280 01	.41235 01	.19245 01	

TABLE I GEOMETRICAL AND INERTIAL CHARACTERISTICS OF THIN SHELLS

$\frac{b}{a}$	$\frac{c}{a}$	$\frac{A_{sg}}{a^2}$	$\frac{\bar{x}_{sg}}{a}$	$\frac{\bar{y}_{sg}}{b}$	$\frac{\bar{z}_{sg}}{c}$	$\frac{I_{xsg}}{\rho ta^4}$	$\frac{I_{ysg}}{\rho ta^4}$	$\frac{I_{zsg}}{\rho ta^4}$	
.10	.10	.13692 00	.44030 00	.55131 00	.59256 00	.11337-02	.37443-01	.37372-01	$\alpha=1.40$ $\beta=2.00$ $\gamma=5.00$
.25	.20	.31145 00	.44443 00	.52754 00	.61299 00	.12844-01	.91267-01	.92567-01	
.50	.25	.53159 00	.44869 00	.48579 00	.65472 00	.59342-01	.16594 00	.19136 00	
.50	.50	.74374 00	.47047 00	.53431 00	.57449 00	.14708 00	.30453 00	.29551 00	
1.00	.10	.79145 00	.42676 00	.41730 00	.76674 00	.19863 00	.20753 00	.39613 00	
1.00	.20	.87682 00	.44333 00	.43607 00	.72142 00	.25263 00	.26136 00	.47299 00	
1.00	1.00	.17419 01	.51470 00	.51338 00	.54796 00	.12866 01	.12961 01	.12260 01	
1.00	2.00	.29645 01	.54065 00	.54092 00	.49259 00	.49763 01	.49893 01	.22576 01	
.10	.10	.13526 00	.43949 00	.57091 00	.57091 00	.11119-02	.36787-01	.36787-01	$\alpha=1.40$ $\beta=3.00$ $\gamma=3.00$
.25	.20	.31062 00	.44734 00	.54401 00	.58837 00	.12763-01	.91502-01	.93573-01	
.50	.25	.53825 00	.45660 00	.49885 00	.62476 00	.60543-01	.17103 00	.19997 00	
.50	.50	.73647 00	.47221 00	.55187 00	.55187 00	.14406 00	.29794 00	.29794 00	
1.00	.10	.83990 00	.44497 00	.43262 00	.71554 00	.22122 00	.23516 00	.44691 00	
1.00	.20	.90949 00	.45668 00	.44866 00	.68133 00	.27035 00	.28142 00	.51328 00	
1.00	1.00	.17233 01	.51863 00	.52737 00	.52737 00	.12562 01	.12484 01	.12484 01	
1.00	2.00	.29311 01	.54290 00	.55545 00	.47630 00	.47609 01	.47362 01	.22926 01	
.10	.10	.14669 00	.45259 00	.58926 00	.61112 00	.13166-02	.42065-01	.42021-01	$\alpha=1.40$ $\beta=3.00$ $\gamma=5.00$
.25	.20	.33641 00	.46093 00	.56038 00	.62996 00	.15009-01	.10502 00	.10696 00	
.50	.25	.57870 00	.46992 00	.51342 00	.67035 00	.69911-01	.19526 00	.22667 00	
.50	.50	.80365 00	.49223 00	.56682 00	.58906 00	.17065 00	.35194 00	.34620 00	
1.00	.10	.86609 00	.45163 00	.43877 00	.78225 00	.23517 00	.25031 00	.47409 00	
1.00	.20	.95766 00	.46802 00	.45816 00	.73698 00	.29845 00	.31260 00	.56449 00	
1.00	1.00	.18791 01	.54055 00	.54110 00	.56127 00	.14822 01	.14932 01	.14465 01	
1.00	2.00	.31759 01	.56826 00	.57117 00	.50332 00	.56196 01	.56322 01	.26531 01	
.10	.10	.15754 00	.46551 00	.62764 00	.62764 00	.15279-02	.47458-01	.47458-01	$\alpha=1.40$ $\beta=5.00$ $\gamma=5.00$
.25	.20	.36389 00	.47747 00	.59583 00	.64442 00	.17544-01	.12075 00	.12359 00	
.50	.25	.62937 00	.49007 00	.54414 00	.68307 00	.82620-01	.22774 00	.26706 00	
.50	.50	.87061 00	.50947 00	.60139 00	.60138 00	.19824 00	.40534 00	.40534 00	
1.00	.10	.94143 00	.47441 00	.46306 00	.79519 00	.27987 00	.29589 00	.56300 00	
1.00	.20	.10413 01	.49069 00	.48400 00	.74955 00	.35494 00	.36765 00	.67036 00	
1.00	1.00	.20335 01	.56419 00	.57229 00	.57228 00	.17143 01	.17091 01	.17091 01	
1.00	2.00	.34217 01	.59349 00	.60423 00	.51262 00	.63643 01	.63464 01	.31246 01	
.10	.10	.12394 00	.42631 00	.53922 00	.53922 00	.92681-03	.31721-01	.31721-01	$\alpha=2.00$ $\beta=2.00$ $\gamma=2.00$
.25	.20	.28422 00	.43255 00	.51638 00	.55499 00	.10659-01	.78158-01	.79939-01	
.50	.25	.49591 00	.44036 00	.47806 00	.58608 00	.51452-01	.14608 00	.17135 00	
.50	.50	.67120 00	.45505 00	.52318 00	.52318 00	.12005 00	.25103 00	.25103 00	
1.00	.10	.80903 00	.42976 00	.42976 00	.65308 00	.21115 00	.21115 00	.41440 00	
1.00	.20	.85890 00	.43948 00	.43948 00	.62993 00	.24540 00	.24540 00	.45879 00	
1.00	1.00	.15708 01	.50000 00	.50000 00	.50000 00	.10472 01	.10472 01	.10472 01	
1.00	2.00	.26848 01	.52318 00	.52318 00	.45505 00	.40165 01	.40165 01	.19208 01	
.10	.10	.13360 00	.43806 00	.56242 00	.57526 00	.10969-02	.35951-01	.35933-01	$\alpha=2.00$ $\beta=2.00$ $\gamma=3.00$
.25	.20	.30588 00	.44426 00	.53741 00	.59338 00	.12556-01	.88698-01	.90545-01	
.50	.25	.52956 00	.45148 00	.49496 00	.63023 00	.59521-01	.16470 00	.19260 00	
.50	.50	.72786 00	.47098 00	.54377 00	.55614 00	.14219 00	.29301 00	.29065 00	
1.00	.10	.82784 00	.43468 00	.43468 00	.72183 00	.22158 00	.22158 00	.43368 00	
1.00	.20	.89705 00	.44868 00	.44868 00	.68680 00	.26870 00	.26870 00	.49885 00	
1.00	1.00	.17077 01	.51952 00	.51952 00	.52962 00	.12392 01	.12392 01	.12219 01	
1.00	2.00	.29079 01	.54593 00	.54593 00	.47759 00	.47178 01	.47178 01	.22481 01	
.10	.10	.14461 00	.44944 00	.58333 00	.61293 00	.12983-02	.40817-01	.40763-01	$\alpha=2.00$ $\beta=2.00$ $\gamma=5.00$
.25	.20	.33080 00	.45579 00	.55675 00	.63280 00	.14789-01	.10099 00	.10279 00	
.50	.25	.56910 00	.46288 00	.51138 00	.67384 00	.69004-01	.18681 00	.21754 00	
.50	.50	.79191 00	.48569 00	.56208 00	.59173 00	.16852 00	.34180 00	.33487 00	
1.00	.10	.85382 00	.44106 00	.44106 00	.78632 00	.23578 00	.23578 00	.46021 00	
1.00	.20	.94476 00	.45900 00	.45900 00	.74038 00	.29755 00	.29755 00	.54873 00	
1.00	1.00	.18607 01	.53674 00	.53674 00	.56275 00	.14681 01	.14681 01	.14132 01	
1.00	2.00	.31487 01	.56558 00	.56558 00	.50442 00	.55801 01	.55801 01	.25955 01	
.10	.10	.14293 00	.44933 00	.59578 00	.59578 00	.12709-02	.40260-01	.40260-01	$\alpha=2.00$ $\beta=3.00$ $\gamma=3.00$
.25	.20	.32903 00	.45872 00	.56697 00	.61311 00	.14595-01	.10112 00	.10349 00	
.50	.25	.57141 00	.46952 00	.51942 00	.65011 00	.69253-01	.19049 00	.22360 00	
.50	.50	.78413 00	.48750 00	.57341 00	.57341 00	.16480 00	.33586 00	.33586 00	
1.00	.10	.88857 00	.45576 00	.45129 00	.74601 00	.25289 00	.25860 00	.50067 00	
1.00	.20	.96477 00	.46547 00	.46730 00	.70915 00	.30907 00	.31287 00	.57793 00	
1.00	1.00	.18406 01	.53993 00	.54586 00	.54586 00	.14325 01	.14237 01	.14237 01	
1.00	2.00	.31236 01	.56751 00	.57492 00	.49103 00	.53850 01	.53645 01	.26168 01	

TABLE I GEOMETRICAL AND INERTIAL CHARACTERISTICS OF THIN SHELLS

$\frac{b}{a}$	$\frac{c}{a}$	$\frac{A_{sg}}{a^2}$	$\frac{\bar{x}_{sg}}{a}$	$\frac{\bar{y}_{sg}}{b}$	$\frac{\bar{z}_{sg}}{c}$	$\frac{I_{xsg}}{\rho ta^4}$	$\frac{I_{ysg}}{\rho ta^4}$	$\frac{I_{zsg}}{\rho ta^4}$		
.10	.10	.15343 00	.46059 00	.61430 00	.63028 00	.14728-02	.45227-01	.45194-01	$\alpha=2.00$ $\beta=3.00$ $\gamma=5.00$	
.25	.20	.35325 00	.47061 00	.58384 00	.64869 00	.16842-01	.11415 00	.11650 00		
.50	.25	.61048 00	.48143 00	.53332 00	.68892 00	.78884-01	.21444 00	.25056 00		
.50	.50	.84712 00	.50309 00	.58862 00	.60540 00	.19126 00	.38792 00	.38343 00		
1.00	.10	.91516 00	.46224 00	.45741 00	.80319 00	.26805 00	.27443 00	.52982 00		
1.00	.20	.10125 01	.48007 00	.47679 00	.75642 00	.33909 00	.34461 00	.63196 00		
1.00	1.00	.19888 01	.55830 00	.56002 00	.57547 00	.16598 01	.16612 01	.16240 01		
1.00	2.00	.33529 01	.58833 00	.59095 00	.51505 00	.62318 01	.62313 01	.29766 01		
.10	.10	.16322 00	.47199 00	.64593 00	.64593 00	.16713-02	.50261-01	.50261-01		$\alpha=2.00$ $\beta=5.00$ $\gamma=5.00$
.25	.20	.37788 00	.48517 00	.61267 00	.66249 00	.19208-01	.12886 00	.13197 00		
.50	.25	.65485 00	.49887 00	.55933 00	.70151 00	.90546-01	.24442 00	.28754 00		
.50	.50	.90838 00	.51981 00	.61726 00	.61726 00	.21744 00	.43883 00	.43883 00		
1.00	.10	.97655 00	.48169 00	.47659 00	.81763 00	.30647 00	.31464 00	.60715 00		
1.00	.20	.10829 01	.49944 00	.49775 00	.76976 00	.38908 00	.39411 00	.72601 00		
1.00	1.00	.21315 01	.57801 00	.58633 00	.58633 00	.18827 01	.18695 01	.18695 01		
1.00	2.00	.35855 01	.60913 00	.61881 00	.52454 00	.69730 01	.69450 01	.34210 01		
.10	.10	.15033 00	.46081 00	.61827 00	.61826 00	.14303-02	.44117-01	.44117-01	$\alpha=3.00$ $\beta=3.00$ $\gamma=3.00$	
.25	.20	.34723 00	.47205 00	.58752 00	.63515 00	.16442-01	.11200 00	.11467 00		
.50	.25	.60472 00	.48452 00	.53786 00	.67241 00	.78117-01	.21269 00	.25007 00		
.50	.50	.83323 00	.50493 00	.59242 00	.59242 00	.18610 00	.37879 00	.37879 00		
1.00	.10	.93606 00	.46829 00	.46829 00	.77321 00	.28493 00	.28493 00	.55769 00		
1.00	.20	.10201 01	.48423 00	.48423 00	.73359 00	.34868 00	.34868 00	.64778 00		
1.00	1.00	.19660 01	.56247 00	.56247 00	.56246 00	.16188 01	.16188 01	.16188 01		
1.00	2.00	.33329 01	.59242 00	.59242 00	.50493 00	.60606 01	.60606 01	.29775 01		
.10	.10	.15992 00	.47003 00	.63705 00	.64753 00	.16273-02	.48714-01	.48692-01		$\alpha=3.00$ $\beta=3.00$ $\gamma=5.00$
.25	.20	.36986 00	.48205 00	.60453 00	.66525 00	.18671-01	.12439 00	.12716 00		
.50	.25	.64232 00	.49480 00	.55247 00	.70505 00	.87952-01	.23607 00	.27702 00		
.50	.50	.89180 00	.51786 00	.60812 00	.61967 00	.21216 00	.42811 00	.42502 00		
1.00	.10	.96294 00	.47447 00	.47447 00	.82161 00	.30131 00	.30131 00	.58873 00		
1.00	.20	.10678 01	.49387 00	.49387 00	.77324 00	.38057 00	.38057 00	.70426 00		
1.00	1.00	.21053 01	.57728 00	.57728 00	.58800 00	.18450 01	.18450 01	.18190 01		
1.00	2.00	.35445 01	.60900 00	.60900 00	.52582 00	.68810 01	.68810 01	.33326 01		
.10	.10	.16864 00	.47960 00	.66250 00	.66250 00	.18111-02	.53308-01	.53308-01	$\alpha=3.00$ $\beta=5.00$ $\gamma=5.00$	
.25	.20	.39162 00	.49425 00	.62781 00	.67867 00	.20842-01	.13781 00	.14119 00		
.50	.25	.68033 00	.50916 00	.57303 00	.71781 00	.98412-01	.26293 00	.30985 00		
.50	.50	.94696 00	.53172 00	.63138 00	.63138 00	.23666 00	.47563 00	.47563 00		
1.00	.10	.10106 01	.49020 00	.48899 00	.83769 00	.33272 00	.33571 00	.65280 00		
1.00	.20	.11244 01	.50960 00	.51032 00	.78758 00	.42316 00	.42343 00	.78454 00		
1.00	1.00	.22344 01	.59304 00	.59900 00	.59900 00	.20557 01	.20426 01	.20426 01		
1.00	2.00	.37595 01	.62549 00	.63135 00	.53568 00	.76103 01	.75854 01	.37406 01		
.10	.10	.17398 00	.48877 00	.67754 00	.67754 00	.19487-02	.56788-01	.56788-01		$\alpha=5.00$ $\beta=5.00$ $\gamma=5.00$
.25	.20	.40571 00	.50535 00	.64141 00	.69306 00	.22473-01	.14830 00	.15195 00		
.50	.25	.70707 00	.52173 00	.58545 00	.73207 00	.10638 00	.28478 00	.33558 00		
.50	.50	.98850 00	.54617 00	.64389 00	.64389 00	.25638 00	.51852 00	.51852 00		
1.00	.10	.10448 01	.50045 00	.50045 00	.85554 00	.35903 00	.35903 00	.70177 00		
1.00	.20	.11676 01	.52192 00	.52192 00	.80311 00	.45794 00	.45794 00	.84896 00		
1.00	1.00	.23483 01	.61048 00	.61048 00	.61048 00	.22389 01	.22389 01	.22389 01		
1.00	2.00	.39540 01	.64389 00	.64389 00	.54616 00	.82963 01	.82963 01	.41020 01		
.10	.10	.18240 00	.49533 00	.69027 00	.69832 00	.21322-02	.61074-01	.61053-01	$\alpha=5.00$ $\beta=5.00$ $\gamma=10.0$	
.25	.20	.42641 00	.51296 00	.65302 00	.71408 00	.24593-01	.16055 00	.16430 00		
.50	.25	.74259 00	.52993 00	.59619 00	.75367 00	.11607 00	.30877 00	.36338 00		
.50	.50	.10416 01	.55533 00	.65402 00	.66426 00	.28146 00	.56655 00	.56307 00		
1.00	.10	.10744 01	.50655 00	.50655 00	.88328 00	.37827 00	.37827 00	.73879 00		
1.00	.20	.12162 01	.53025 00	.53025 00	.82682 00	.49227 00	.49227 00	.91110 00		
1.00	1.00	.24731 01	.62006 00	.62006 00	.63032 00	.24582 01	.24582 01	.24263 01		
1.00	2.00	.41324 01	.65385 00	.65385 00	.56327 00	.90937 01	.90937 01	.44118 01		
.10	.10	.19237 00	.50843 00	.71439 00	.71438 00	.23679-02	.67549-01	.67549-01		$\alpha=10.0$ $\beta=10.0$ $\gamma=10.0$
.25	.20	.45281 00	.52961 00	.67598 00	.72805 00	.27473-01	.18039 00	.18492 00		
.50	.25	.79045 00	.54872 00	.61778 00	.76632 00	.13044 00	.34859 00	.41148 00		
.50	.50	.11171 01	.57556 00	.67671 00	.67671 00	.31645 00	.64271 00	.64271 00		
1.00	.10	.11261 01	.52339 00	.52339 00	.89919 00	.42036 00	.42036 00	.82145 00		
1.00	.20	.12848 01	.54903 00	.54903 00	.84034 00	.55224 00	.55224 00	.10243 01		
1.00	1.00	.26673 01	.64239 00	.64239 00	.64239 00	.27826 01	.27826 01	.27826 01		
1.00	2.00	.44684 01	.67671 00	.67671 00	.57555 00	.10283 02	.10283 02	.50633 01		

TABLE II VALUES OF x/a , y/b AND z/c

		$\alpha = 0.50$			$\beta = 0.50$			$\gamma = 2.00$						z		
X=	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99400	.001
Y=	.93775	.68359	.54085	.46754	.30557	.20455	.13509	.08579	.05081	.02668	.01115	.00263	.00127	.00023	.00000	
X=	.00100	.02995	.06987	.09982	.15964	.29946	.39928	.49910	.59892	.69874	.79856	.89838	.92833	.96825	.99720	.030
Y=	.93607	.68236	.53988	.46670	.30502	.20419	.13485	.08563	.05072	.02663	.01113	.00263	.00127	.00023	.00000	
X=	.00099	.02971	.06932	.09902	.19804	.29707	.39609	.49511	.59413	.69316	.79218	.89120	.92091	.96052	.98923	.070
Y=	.92859	.67691	.53556	.46297	.30259	.20256	.13377	.08495	.05031	.02642	.01104	.00261	.00126	.00023	.00000	
X=	.00098	.02940	.06861	.09801	.19602	.29403	.39204	.49005	.58806	.68607	.78408	.88209	.91149	.95070	.97912	.100
Y=	.91909	.66999	.53009	.45824	.29949	.20048	.13240	.08408	.04980	.02615	.01092	.00258	.00124	.00022	.00000	
X=	.00092	.02765	.06451	.09216	.18432	.27648	.36864	.46080	.55296	.64512	.73728	.82944	.85709	.89395	.92068	.200
Y=	.86423	.63000	.49845	.42089	.28162	.18852	.12450	.07906	.04682	.02459	.01027	.00243	.00117	.00023	.00000	
X=	.00083	.02484	.05797	.08281	.16562	.24843	.33124	.41405	.49686	.57967	.66248	.74529	.77013	.80326	.82727	.300
Y=	.77655	.56608	.44788	.38717	.25304	.16939	.11187	.07104	.04207	.02209	.00923	.00218	.00105	.00019	.00000	
X=	.00071	.02117	.04939	.07056	.14112	.21168	.28224	.35280	.42336	.49392	.56448	.63504	.65621	.68443	.70489	.400
Y=	.66168	.48234	.38162	.32151	.21561	.14433	.09532	.06053	.03585	.01883	.00786	.00186	.00090	.00016	.00000	
X=	.00056	.01687	.03937	.05625	.11250	.16875	.22500	.28125	.33750	.39375	.45000	.50625	.52312	.54562	.56194	.500
Y=	.52749	.38452	.30423	.26299	.17188	.11506	.07599	.04825	.02858	.01501	.00627	.00148	.00071	.00013	.00000	
X=	.00041	.01229	.02867	.04096	.08192	.12288	.16384	.20480	.24576	.28672	.32768	.36864	.38093	.39731	.40919	.600
Y=	.38410	.28000	.22153	.19151	.12516	.08379	.05533	.03514	.02081	.01093	.00457	.00108	.00052	.00009	.00000	
X=	.00026	.00780	.01821	.02601	.05202	.07803	.10404	.13005	.15606	.18207	.20808	.23409	.24189	.25230	.25984	.700
Y=	.24391	.17780	.14068	.12161	.07948	.05320	.03514	.02231	.01321	.00694	.00290	.00068	.00033	.00006	.00000	
X=	.00013	.00389	.00907	.01296	.02592	.03888	.05184	.06480	.07776	.09072	.10368	.11664	.12053	.12571	.12947	.800
Y=	.12153	.08859	.07009	.06059	.03960	.02651	.01751	.01112	.00658	.00346	.00144	.00034	.00016	.00003	.00000	
X=	.00004	.00108	.00253	.00361	.00722	.01083	.01444	.01805	.02166	.02527	.02888	.03249	.03357	.03502	.03606	.900
Y=	.03385	.02468	.01952	.01688	.01103	.00738	.00488	.00310	.00183	.00076	.00040	.00010	.00005	.00001	.00000	
X=	.00002	.00055	.00128	.00183	.00365	.00548	.00730	.00913	.01095	.01278	.01460	.01643	.01697	.01770	.01823	.930
Y=	.01712	.01248	.00987	.00853	.00558	.00373	.00247	.00157	.00093	.00049	.00020	.00005	.00002	.00000	.00000	
X=	.00000	.00010	.00024	.00035	.00070	.00105	.00140	.00175	.00210	.00244	.00279	.00314	.00325	.00339	.00349	.970
Y=	.00328	.00239	.00189	.00163	.00107	.00071	.00047	.00030	.00018	.00009	.00004	.00001	.00000	.00000	.00000	
X=	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.999
Y=	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	

		$\alpha = 0.50$			$\beta = 0.50$			$\gamma = 3.00$						z		
X=	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001
Y=	.93775	.68359	.54085	.46754	.30557	.20455	.13509	.08579	.05081	.02668	.01115	.00263	.00127	.00023	.00000	
X=	.00100	.03000	.07000	.09999	.19999	.29998	.39998	.49997	.59997	.69996	.79996	.89995	.92995	.96995	.99895	.030
Y=	.93770	.68355	.54082	.46752	.30556	.20454	.13508	.08578	.05080	.02668	.01115	.00263	.00127	.00023	.00000	
X=	.00100	.02998	.06995	.09993	.19986	.29979	.39973	.49966	.59959	.69952	.79945	.89938	.92936	.96933	.99831	.070
Y=	.93711	.68312	.54048	.46722	.30536	.20441	.13500	.08573	.05077	.02666	.01114	.00263	.00127	.00023	.00000	
X=	.00100	.02994	.06986	.09980	.19960	.29940	.39920	.49900	.59880	.69860	.79840	.89820	.92814	.96806	.99700	.100
Y=	.93588	.68222	.53977	.46661	.30496	.20415	.13482	.08561	.05071	.02663	.01112	.00263	.00127	.00023	.00000	
X=	.00098	.02952	.06888	.09841	.19681	.29522	.39363	.49203	.59044	.68884	.78725	.88566	.91518	.95454	.98308	.200
Y=	.92281	.67270	.53223	.46009	.30070	.20130	.13294	.08442	.05000	.02625	.01097	.00259	.00125	.00022	.00000	
X=	.00095	.02840	.06627	.09467	.18935	.28402	.37869	.47336	.56804	.66271	.75738	.85206	.88064	.91833	.94578	.300
Y=	.88780	.64717	.51204	.44264	.28929	.19366	.12789	.08122	.04810	.02526	.01055	.00249	.00120	.00022	.00000	
X=	.00088	.02628	.06133	.08761	.17522	.26283	.35044	.43805	.52566	.61327	.70088	.78849	.81477	.84981	.87522	.400
Y=	.82156	.59889	.47384	.40961	.26771	.17921	.11835	.07516	.04451	.02337	.00976	.00231	.00111	.00020	.00000	
X=	.00077	.02297	.05359	.07656	.15312	.22969	.30625	.38281	.45937	.53594	.61250	.68906	.71203	.74266	.76486	.500
Y=	.71797	.52337	.41409	.35796	.23395	.15641	.10343	.06568	.03890	.02043	.00853	.00202	.00097	.00017	.00000	
X=	.00061	.01844	.04303	.06147	.12293	.18440	.24586	.30733	.36879	.43026	.49172	.55319	.57163	.59622	.61404	.600
Y=	.57640	.42017	.33244	.28738	.18782	.12573	.08303	.05273	.03123	.01640	.00685	.00162	.00078	.00014	.00000	
X=	.00043	.01295	.03022	.04316	.08633	.12949	.17266	.21582	.25899	.30215	.34532	.38848	.40143	.41870	.43122	.700
Y=	.40478	.29507	.23346	.20182	.13190	.08830	.05831	.03703	.02193	.01152	.00481	.00114	.00055	.00010	.00000	
X=	.00024	.00714	.01667	.02381	.04763	.07144	.09526	.11907	.14289	.16670	.19052	.21433	.22147	.23100	.23791	.800
Y=	.22332	.16279	.12880	.11134	.07277	.04871	.03217	.02043	.01210	.00635	.00265	.00063	.00030	.00005	.00000	
X=	.00007	.00220	.00514	.00734	.01469	.02203	.02938	.03673	.04408	.05143	.05878	.06613	.06830	.07174	.07337	.900
Y=	.06887	.05020	.03972	.03434	.02244	.01502	.00992	.00630	.00373	.00196	.00082	.00019	.00009	.00002	.00000	
X=	.00004	.00115	.00268	.00383	.00766	.01148	.01531	.01914	.02297	.02679	.03062	.03445	.03560	.03713	.03824	.930
Y=	.03589	.02617	.02070	.01790	.01170	.00783	.00517	.00328	.00194	.00102	.00043	.00010	.00005	.00001	.00000	
X=	.00001	.00023	.00053	.00076	.00153	.00229	.00305	.00381	.00458	.00534	.00610	.00686	.00709	.00740	.00762	.970
Y=	.00715	.00521	.00412	.00357	.00233	.00156	.00103	.00065	.00039	.00020	.00008	.00002	.00001	.00000	.00000	
X=	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00001	.00001	.00001	.00001	.00001	.00001	.00001	.999
Y=	.00001	.00001	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	

TABLE II VALUES OF x/a , y/b AND z/c

		$\alpha = 0.50$				$\beta = 1.40$				$\gamma = 3.00$				z		
X=	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001
Y=	.97731	.87297	.80292	.76222	.65481	.56736	.48922	.41599	.34501	.27411	.20070	.11988	.09239	.05007	.00439	
X=	.00100	.03000	.07000	.09999	.19595	.29998	.39998	.49997	.59997	.69996	.79996	.89995	.92995	.96995	.99895	.030
Y=	.97729	.87295	.80290	.76220	.65479	.56735	.48921	.41598	.34500	.27410	.20069	.11988	.09239	.05007	.00439	
X=	.00100	.02998	.06995	.09993	.19986	.29979	.39973	.49966	.59959	.69952	.79945	.89938	.92936	.96933	.99831	.070
Y=	.97707	.87275	.80272	.76203	.65465	.56722	.48910	.41588	.34492	.27404	.20065	.11985	.09237	.05006	.00439	
X=	.00100	.02994	.06986	.09980	.19960	.29940	.39920	.49900	.59880	.69860	.79840	.89820	.92814	.96805	.99700	.100
Y=	.97661	.87234	.80234	.76167	.65434	.56696	.48887	.41569	.34476	.27391	.20055	.11980	.09232	.05003	.00438	
X=	.00098	.02952	.06888	.09841	.19681	.29522	.39363	.49203	.59044	.68884	.78725	.88566	.91518	.95454	.98308	.200
Y=	.97172	.86797	.79832	.75786	.65106	.56412	.48642	.41361	.34303	.27254	.19955	.11920	.09186	.04978	.00436	
X=	.00095	.02840	.06627	.09467	.18535	.28402	.37869	.47336	.56804	.66271	.75738	.85206	.88046	.91833	.94578	.300
Y=	.95839	.85607	.78737	.74746	.64213	.55638	.47975	.40793	.33633	.26880	.19681	.11756	.09660	.04910	.00430	
X=	.00088	.02628	.06133	.08761	.17522	.26283	.35044	.43805	.52566	.61327	.70088	.78849	.81477	.84981	.87522	.400
Y=	.93221	.83269	.76587	.72705	.62459	.54118	.46665	.39679	.32909	.26146	.19143	.11435	.08813	.04776	.00418	
X=	.00077	.02297	.05359	.07656	.15312	.22969	.30625	.38281	.45937	.53594	.61250	.68906	.71203	.74266	.76486	.500
Y=	.88840	.79355	.72987	.69288	.59524	.51575	.44472	.37814	.31362	.24917	.18244	.10898	.08399	.04551	.00399	
X=	.00061	.01844	.04303	.06147	.12293	.18440	.24586	.30733	.36879	.43026	.49172	.55319	.57163	.59622	.61404	.600
Y=	.82138	.73369	.67481	.64061	.55033	.47684	.41117	.34961	.28996	.23037	.16867	.10076	.07765	.04208	.00369	
X=	.00043	.01295	.03022	.04316	.08633	.12949	.17266	.21582	.25898	.30215	.34532	.38848	.40143	.41870	.43122	.700
Y=	.72397	.64668	.59478	.56664	.48507	.42029	.36241	.30815	.25558	.20305	.14867	.08881	.06844	.03709	.00325	
X=	.00024	.00714	.01667	.02381	.04763	.07144	.09526	.11907	.14289	.16670	.19052	.21433	.22147	.23100	.23791	.800
Y=	.58543	.52293	.48096	.45659	.39224	.33986	.29306	.24918	.20667	.16420	.12022	.07101	.05534	.02999	.00263	
X=	.00007	.00220	.00514	.00734	.01469	.02203	.02938	.03672	.04406	.05141	.05875	.06610	.06830	.07124	.07337	.900
Y=	.38460	.34354	.31597	.29966	.25769	.22327	.19252	.16370	.13577	.10787	.07898	.04718	.03636	.01970	.00173	
X=	.00004	.00115	.00268	.00383	.00766	.01148	.01531	.01914	.02297	.02679	.03062	.03445	.03560	.03713	.03824	.930
Y=	.30474	.27221	.25036	.23767	.20418	.17691	.15255	.12971	.10758	.08547	.06258	.03738	.02881	.01561	.00137	
X=	.00001	.00023	.00053	.00076	.00153	.00229	.00305	.00381	.00458	.00534	.00610	.00686	.00709	.00740	.00762	.970
Y=	.17128	.15299	.14072	.13358	.11476	.09943	.08574	.07290	.06047	.04804	.03517	.02101	.01619	.00877	.00077	
X=	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00001	.00001	.00001	.00001	.00001	.00001	.00001	.999
Y=	.01541	.01376	.01266	.01201	.01032	.00894	.00771	.00656	.00544	.00432	.00316	.00189	.00146	.00079	.00007	

		$\alpha = 0.50$				$\beta = 2.00$				$\gamma = 2.00$				z		
X=	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001
Y=	.98400	.90528	.85757	.82690	.74350	.67252	.60625	.54120	.47477	.40415	.32492	.22653	.18877	.12294	.02236	
X=	.00100	.02995	.06987	.09982	.19564	.29946	.39928	.49910	.59892	.69874	.79856	.89838	.92833	.96825	.99720	.030
Y=	.98362	.90887	.85718	.82653	.74316	.67221	.60598	.54093	.47455	.40397	.32477	.22643	.18869	.12288	.02235	
X=	.00099	.02971	.06932	.09902	.19804	.29707	.39609	.49511	.59413	.69316	.79218	.89120	.92091	.96052	.98923	.070
Y=	.98165	.90705	.85547	.82488	.74167	.67087	.60477	.53987	.47360	.40316	.32412	.22598	.18831	.12264	.02231	
X=	.00098	.02940	.06861	.09801	.19602	.29403	.39204	.49005	.58806	.68607	.78408	.88209	.91149	.95070	.97912	.100
Y=	.97913	.90472	.85327	.82276	.73977	.66914	.60322	.53848	.47239	.40213	.32329	.22540	.18783	.12232	.02225	
X=	.00092	.02765	.06451	.09216	.18432	.27648	.36864	.46080	.55296	.64512	.73728	.82944	.85709	.89395	.92068	.200
Y=	.96418	.89091	.84024	.81020	.72847	.65893	.59401	.53026	.46517	.39599	.31835	.22196	.18496	.12046	.02191	
X=	.00083	.02484	.05797	.08281	.16562	.24843	.33124	.41405	.49686	.57967	.66248	.74529	.77013	.80326	.82727	.300
Y=	.93873	.86740	.81807	.78882	.70925	.64154	.57833	.51627	.45290	.38554	.30995	.21610	.18008	.11728	.02133	
X=	.00071	.02117	.04939	.07056	.14112	.21168	.28224	.35280	.42336	.49392	.56448	.63504	.65621	.68443	.70489	.400
Y=	.90191	.83337	.78598	.75787	.68143	.61637	.55564	.49601	.43513	.37041	.29779	.20762	.17301	.11268	.02050	
X=	.00056	.01687	.03937	.05625	.11250	.16875	.22500	.28125	.33750	.39375	.45000	.50625	.52312	.54562	.56194	.500
Y=	.85222	.78746	.74268	.71612	.64389	.58242	.52503	.46869	.41116	.35001	.28139	.19618	.16348	.10647	.01937	
X=	.00041	.01229	.02867	.04096	.08192	.12288	.16384	.20480	.24576	.28672	.32768	.36864	.38093	.39731	.40919	.600
Y=	.78725	.72743	.68606	.66152	.59480	.53801	.48500	.43296	.37981	.32332	.25994	.18123	.15102	.09835	.01789	
X=	.00026	.00780	.01821	.02601	.05202	.07803	.10404	.13005	.15606	.18207	.20808	.23409	.24189	.25230	.25984	.700
Y=	.70276	.64936	.61243	.59053	.53096	.48027	.43295	.38649	.33905	.28862	.23204	.16176	.13481	.08780	.01597	
X=	.00013	.00389	.00907	.01296	.02592	.03888	.05184	.06480	.07776	.09072	.10368	.11664	.12053	.12571	.12947	.800
Y=	.59044	.54557	.51454	.49614	.44611	.40351	.36375	.32472	.28486	.24249	.19495	.13592	.11326	.07376	.01342	
X=	.00004	.00108	.00253	.00361	.00722	.01083	.01444	.01805	.02166	.02527	.02888	.03249	.03357	.03502	.03606	.900
Y=	.42894	.39635	.37381	.36044	.32408	.29314	.26426	.23590	.20695	.17617	.14163	.09874	.08228	.05359	.00975	
X=	.00002	.00055	.00128	.00183	.00366	.00549	.00732	.00915	.01098	.01281	.01464	.01647	.01697	.01770	.01823	.930
Y=	.36170	.33422	.31521	.30394	.27328	.24719	.22780	.20913	.19182	.17450	.14855	.11943	.08326	.06938	.04519	
X=	.00000	.00010	.00024	.00035	.00070	.00105	.00140	.00175	.00210	.00244	.00279	.00314	.00325	.00339	.00349	.970
Y=	.23923	.22105	.20848	.20102	.18075	.16349	.14738	.13157	.11542	.09825	.07899	.05507	.04589	.02989	.00544	
X=	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.999
Y=	.04400	.04065	.03834	.03697	.03324	.03007	.02711	.02420	.02123	.01807	.01453	.01013	.00844	.00550	.00100	

TABLE II VALUES OF x/a , y/b AND z/c

		$\alpha = 0.50$				$\beta = 2.00$				$\gamma = 3.00$				z		
X =	.C0100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001
Y =	.98406	.90528	.85757	.82691	.74350	.67252	.60625	.54120	.47477	.40415	.32492	.22653	.18877	.12294	.02236	
X =	.C0100	.03000	.07000	.10000	.19599	.29998	.39998	.49997	.59997	.69996	.79996	.89995	.92995	.96995	.99895	.030
Y =	.98405	.90927	.85756	.82689	.74349	.67251	.60625	.54119	.47476	.40415	.32492	.22653	.18877	.12294	.02236	
X =	.C0100	.02958	.06995	.C9993	.19986	.29979	.39973	.49966	.59959	.69952	.79945	.89938	.92936	.96933	.99831	.070
Y =	.98389	.90911	.85742	.82676	.74337	.67240	.60615	.54110	.47469	.40408	.32486	.22649	.18874	.12292	.02236	
X =	.00100	.02994	.06986	.C9980	.19960	.29940	.39920	.49900	.59880	.69860	.79840	.89820	.92814	.96806	.99700	.100
Y =	.98357	.90883	.85714	.82649	.74312	.67218	.60595	.54093	.47453	.40395	.32476	.22642	.18868	.12288	.02235	
X =	.00098	.02952	.06888	.C9841	.19681	.29522	.39363	.49203	.59044	.68884	.78725	.88566	.91518	.95454	.98300	.200
Y =	.98309	.90835	.85742	.82676	.74337	.67240	.60615	.54110	.47469	.40408	.32486	.22649	.18874	.12292	.02236	
X =	.00095	.02840	.06627	.09467	.18935	.28402	.37869	.47336	.56804	.66271	.75738	.85206	.88046	.91833	.94578	.300
Y =	.97069	.89692	.84591	.81567	.73339	.66337	.59801	.53384	.46831	.39866	.32050	.22345	.18621	.12127	.02206	
X =	.00088	.02628	.06133	.08761	.17522	.26283	.35044	.43805	.52566	.61327	.70088	.78849	.81477	.84981	.87522	.400
Y =	.95205	.87970	.82967	.80001	.71631	.65064	.58653	.52399	.45932	.39101	.31435	.21916	.18263	.11894	.02164	
X =	.00077	.02297	.05359	.07656	.15312	.22969	.30625	.38281	.45937	.53594	.61250	.68906	.71203	.74266	.76486	.500
Y =	.92051	.85056	.80218	.77350	.69548	.62908	.56710	.50624	.44410	.37805	.30393	.21190	.17658	.11500	.02092	
X =	.00061	.01844	.04303	.06147	.12293	.18440	.24586	.30733	.36879	.43026	.49172	.55319	.57163	.59622	.61404	.600
Y =	.87133	.80511	.75932	.73217	.65832	.59547	.53680	.47920	.42038	.35785	.28770	.20058	.16715	.10886	.01980	
X =	.00043	.01295	.03022	.04316	.08633	.12949	.17266	.21582	.25899	.30215	.34532	.38848	.40143	.41870	.43122	.700
Y =	.79764	.73702	.69511	.67025	.60264	.54511	.49140	.43867	.38692	.32759	.26337	.18362	.15301	.09965	.01813	
X =	.00024	.00714	.01667	.02381	.04763	.07144	.09526	.11907	.14289	.16670	.19052	.21433	.22147	.23100	.23791	.800
Y =	.68744	.63520	.59907	.57765	.51538	.46980	.42351	.37806	.33166	.28233	.22699	.15825	.13187	.08588	.01562	
X =	.00007	.00220	.00514	.00734	.01469	.02203	.02938	.03672	.04406	.05141	.05875	.06610	.06830	.07124	.07337	.900
Y =	.51228	.47335	.44643	.43047	.38705	.35010	.31560	.28173	.24715	.21039	.16915	.11793	.09827	.06400	.01164	
X =	.00004	.00115	.00268	.00383	.00766	.01148	.01531	.01914	.02297	.02679	.03062	.03445	.03560	.03713	.03824	.930
Y =	.43527	.40219	.37932	.36375	.32886	.29746	.26816	.23938	.21000	.17876	.14377	.10020	.08350	.05438	.00989	
X =	.00001	.00023	.00053	.00076	.00153	.00229	.00305	.00381	.00458	.00534	.00610	.00686	.00709	.00740	.00762	.970
Y =	.29080	.26870	.25342	.24436	.21971	.19874	.17916	.15993	.14030	.11943	.09602	.06694	.05578	.03633	.00661	
X =	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00001	.00001	.00001	.00001	.00001	.00001	.00012	.999
Y =	.05387	.04978	.04695	.04527	.04070	.03682	.03319	.02963	.02599	.02213	.01779	.01240	.01033	.00673	.00122	

		$\alpha = 0.50$				$\beta = 3.00$				$\gamma = 3.00$				z		
X =	.C0100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001
Y =	.98935	.93857	.90264	.88099	.82070	.76760	.71631	.66410	.60858	.54664	.47263	.37161	.32907	.24725	.07938	
X =	.00100	.03000	.07000	.10000	.19999	.29998	.39998	.49997	.59997	.69996	.79996	.89995	.92995	.96995	.99895	.030
Y =	.98934	.93856	.90263	.88098	.82070	.76759	.71631	.66410	.60858	.54663	.47262	.37161	.32507	.24724	.07938	
X =	.00100	.02958	.06995	.C9993	.19986	.29979	.39973	.49966	.59959	.69952	.79945	.89938	.92936	.96933	.99831	.070
Y =	.98923	.93846	.90253	.88089	.82061	.76751	.71623	.66403	.60851	.54657	.47257	.37157	.32904	.24722	.07937	
X =	.00100	.02994	.06986	.C9980	.19960	.29940	.39920	.49900	.59880	.69860	.79840	.89820	.92814	.96806	.99700	.100
Y =	.98902	.93826	.90234	.88070	.82043	.76734	.71607	.66388	.60838	.54645	.47247	.37149	.32896	.24716	.07935	
X =	.00098	.02952	.06888	.C9841	.19681	.29522	.39363	.49203	.59044	.68884	.78725	.88566	.91518	.95454	.98300	.200
Y =	.98870	.93606	.90022	.87863	.81851	.76555	.71440	.66233	.60696	.54517	.47136	.37062	.32819	.24658	.07917	
X =	.00095	.02840	.06627	.09467	.18935	.28402	.37869	.47336	.56804	.66271	.75738	.85206	.88046	.91833	.94578	.300
Y =	.98036	.93004	.89444	.87299	.81325	.76063	.70981	.65807	.60306	.54167	.46833	.36823	.32608	.24500	.07866	
X =	.00088	.02628	.06133	.08761	.17522	.26283	.35044	.43805	.52566	.61327	.70088	.78849	.81477	.84981	.87522	.400
Y =	.96777	.91810	.88295	.86178	.80281	.75086	.70069	.64962	.59531	.53472	.46232	.36351	.32190	.24185	.07765	
X =	.00077	.02297	.05359	.07656	.15312	.22969	.30625	.38281	.45937	.53594	.61250	.68906	.71203	.74266	.76486	.500
Y =	.94628	.89771	.86334	.84264	.78497	.73418	.68513	.63519	.58209	.52284	.45205	.35543	.31475	.23648	.07592	
X =	.00061	.01844	.04303	.06147	.12293	.18440	.24586	.30733	.36879	.43026	.49172	.55319	.57163	.59622	.61404	.600
Y =	.91226	.86544	.83231	.81235	.75676	.70779	.66050	.61236	.56117	.50405	.43580	.34266	.30343	.22798	.07319	
X =	.00043	.01295	.03022	.04316	.08633	.12949	.17266	.21582	.25899	.30215	.34532	.38848	.40143	.41870	.43122	.700
Y =	.86008	.81593	.78470	.76588	.71347	.66730	.62272	.57733	.52906	.47521	.41087	.32305	.28608	.21494	.06991	
X =	.00024	.00714	.01667	.02381	.04763	.07144	.09526	.11907	.14289	.16670	.19052	.21433	.22147	.23100	.23791	.800
Y =	.77891	.73893	.71065	.69360	.64614	.60433	.56395	.52285	.47914	.43037	.37210	.29257	.25908	.19466	.06249	
X =	.00007	.00220	.00514	.00734	.01469	.02203	.02938	.03672	.04406	.05141	.05875	.06610	.06830	.07124	.07337	.900
Y =	.64023	.60737	.58412	.57011	.53110	.49674	.46355	.42976	.39383	.35374	.30585	.24048	.21295	.16000	.05137	
X =	.00004	.00115	.00268	.00383	.00766	.01148	.01531	.01914	.02297	.02679	.03062	.03445	.03560	.03713	.03824	.930
Y =	.57434	.54486	.52400	.51144	.47644	.44581	.41584	.38553	.35330	.31734	.27437	.21573	.19104	.14353	.04608	
X =	.00001	.00023	.00053	.00076	.00153	.00229	.00305	.00381	.00458	.00534	.00610	.00686	.00709	.00740	.00762	.970
Y =	.43893	.41640	.40046	.39086	.36411	.34055	.31780	.29464	.27000	.24252	.20968	.16487	.14600	.10969	.03521	
X =	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00001	.00001	.00001	.00001	.00001	.00001	.00012	.999
Y =	.14264	.13532	.13014	.12702	.11233	.11067	.10328	.09575	.08774	.07881	.06814	.05358	.04745	.03565	.01144	

TABLE II VALUES OF x/a , y/b AND z/c

		$\alpha = 0.50$				$\beta = 3.00$				$\gamma = 5.00$				z		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001
Y =	.98935	.93857	.90264	.88099	.82070	.76760	.71631	.66410	.60858	.54664	.47263	.37161	.32907	.24725	.07938	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.030
Y =	.98935	.93857	.90264	.88099	.82070	.76760	.71631	.66410	.60858	.54664	.47263	.37161	.32907	.24725	.07938	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.070
Y =	.98935	.93857	.90264	.88099	.82070	.76760	.71631	.66410	.60858	.54663	.47263	.37161	.32907	.24725	.07938	
X =	.00100	.03000	.07000	.10000	.20000	.29999	.39999	.49999	.59999	.69999	.79998	.89998	.92998	.96998	.99898	.100
Y =	.98934	.93857	.90263	.88099	.82070	.76760	.71631	.66410	.60858	.54663	.47262	.37161	.32907	.24724	.07938	
X =	.00100	.02998	.06996	.09994	.19987	.29981	.39974	.49968	.59962	.69955	.79949	.89942	.92940	.96938	.99836	.200
Y =	.98924	.93847	.90254	.88090	.82062	.76752	.71624	.66403	.60852	.54658	.47258	.37157	.32904	.24722	.07937	
X =	.00100	.02985	.06966	.09951	.19934	.29854	.39806	.49757	.59709	.69660	.79612	.89563	.92549	.96529	.99415	.300
Y =	.98854	.93781	.90190	.88027	.82004	.76698	.71573	.66357	.60809	.54619	.47224	.37131	.32881	.24724	.07931	
X =	.00098	.02939	.06857	.09796	.19592	.29389	.39185	.48981	.58777	.68574	.78370	.88166	.91105	.95024	.97865	.400
Y =	.98596	.93535	.89954	.87797	.81789	.76497	.71386	.66183	.60650	.54476	.47101	.37034	.32795	.24640	.07911	
X =	.00094	.02815	.06569	.09385	.18770	.28154	.37539	.46924	.56309	.65693	.75078	.84463	.87270	.91032	.93754	.500
Y =	.97893	.92869	.89313	.87171	.81206	.75952	.70877	.65711	.60218	.54088	.46765	.36770	.32561	.24464	.07854	
X =	.00085	.02552	.05954	.08505	.17C11	.25516	.34021	.42526	.51032	.59537	.68042	.76547	.79099	.82501	.84968	.600
Y =	.96301	.91358	.87861	.85753	.79885	.74716	.69724	.64642	.59238	.53208	.46004	.36172	.32031	.24066	.07726	
X =	.00069	.02076	.04845	.06921	.13842	.20763	.27684	.34605	.41526	.48448	.55369	.62290	.64366	.67134	.69142	.700
Y =	.93049	.88273	.84894	.82858	.77188	.72193	.67370	.62460	.57238	.51411	.44451	.34950	.30950	.23254	.07466	
X =	.00045	.01356	.03164	.04520	.09040	.13560	.18081	.22601	.27121	.31641	.36161	.40681	.42037	.43845	.45156	.800
Y =	.86671	.82223	.79075	.77178	.71897	.67245	.62752	.59178	.53315	.47888	.41404	.32555	.28828	.21660	.06954	
X =	.00017	.00503	.01174	.01677	.03354	.05031	.06708	.08385	.10062	.11739	.13416	.15093	.15596	.16267	.16753	.900
Y =	.73469	.69698	.67030	.65422	.60945	.57002	.53193	.49316	.45193	.40593	.35097	.27596	.24437	.18360	.05894	
X =	.00009	.00278	.00648	.00926	.01852	.02778	.03704	.04630	.05556	.06482	.07408	.08335	.08612	.08983	.09251	.930
Y =	.66546	.63130	.60714	.59258	.55202	.51631	.48181	.44669	.40935	.36768	.31790	.24995	.22134	.16630	.05339	
X =	.00005	.00060	.00140	.00200	.00395	.00599	.00798	.00998	.01197	.01397	.01596	.01796	.01856	.01936	.01994	.970
Y =	.51526	.48882	.47010	.45883	.42743	.39977	.37306	.34587	.31696	.28469	.24615	.19354	.17138	.12877	.04134	
X =	.00000	.00000	.00000	.00000	.00000	.00001	.00001	.00001	.00001	.00002	.00002	.00002	.00002	.00002	.00002	.999
Y =	.16906	.16039	.15425	.15055	.14025	.13117	.12241	.11349	.10400	.09341	.08076	.06350	.05623	.04225	.01356	

		$\alpha = 0.50$				$\beta = 5.00$				$\gamma = 5.00$				z		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001
Y =	.99359	.96267	.94039	.92679	.88820	.85326	.81858	.78224	.74232	.69601	.63784	.55214	.51330	.43239	.21868	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.030
Y =	.99359	.96267	.94039	.92679	.88820	.85326	.81858	.78224	.74232	.69601	.63784	.55214	.51330	.43239	.21868	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.070
Y =	.99359	.96267	.94039	.92679	.88820	.85326	.81858	.78224	.74232	.69601	.63784	.55214	.51330	.43239	.21868	
X =	.00100	.03000	.07000	.10000	.20000	.29999	.39999	.49999	.59999	.69999	.79998	.89998	.92998	.96998	.99898	.100
Y =	.99359	.96267	.94039	.92679	.88820	.85326	.81858	.78224	.74232	.69601	.63784	.55214	.51330	.43239	.21868	
X =	.00100	.02998	.06996	.09994	.19987	.29981	.39974	.49968	.59962	.69955	.79949	.89942	.92940	.96938	.99836	.200
Y =	.99353	.96261	.94033	.92673	.88814	.85320	.81853	.78219	.74227	.69597	.63780	.55211	.51327	.43236	.21867	
X =	.00100	.02985	.06966	.09951	.19934	.29854	.39806	.49757	.59709	.69660	.79612	.89563	.92549	.96529	.99415	.300
Y =	.99311	.96221	.93993	.92634	.88777	.85284	.81818	.78186	.74196	.69568	.63753	.55187	.51305	.43218	.21858	
X =	.00098	.02939	.06857	.09796	.19592	.29389	.39185	.48981	.58777	.68574	.78370	.88166	.91105	.95024	.97865	.400
Y =	.99155	.96070	.93846	.92489	.88637	.85150	.81690	.78063	.74080	.69458	.63653	.55101	.51225	.43150	.21824	
X =	.00094	.02815	.06569	.09385	.18770	.28154	.37539	.46924	.56309	.65693	.75078	.84463	.87270	.91032	.93754	.500
Y =	.98730	.95658	.93444	.92093	.88258	.84786	.81340	.77729	.73762	.69161	.63380	.54865	.51006	.42965	.21730	
X =	.00085	.02552	.05954	.08505	.17C11	.25516	.34021	.42526	.51032	.59537	.68042	.76547	.79099	.82501	.84968	.600
Y =	.97764	.94721	.92529	.91191	.87394	.83956	.80544	.76968	.73040	.68484	.62759	.54328	.50506	.42545	.21517	
X =	.00069	.02076	.04845	.06921	.13842	.20763	.27684	.34605	.41526	.48448	.55369	.62290	.64366	.67134	.69142	.700
Y =	.95769	.92789	.90641	.89330	.85611	.82243	.78900	.75398	.71550	.67087	.61479	.53219	.49476	.41677	.21078	
X =	.00045	.01356	.03164	.04520	.09040	.13560	.18081	.22601	.27121	.31641	.36161	.40681	.42037	.43845	.45156	.800
Y =	.91775	.88919	.86861	.85605	.82040	.78813	.75610	.72253	.68566	.64289	.58915	.51000	.47412	.39939	.20199	
X =	.00017	.00503	.01174	.01677	.03354	.05031	.06708	.08385	.10062	.11739	.13416	.15093	.15596	.16267	.16753	.900
Y =	.83112	.80525	.78661	.77524	.74296	.71373	.68472	.65433	.62093	.58220	.53354	.46185	.42937	.36168	.18292	
X =	.00009	.00278	.00648	.00926	.01852	.02778	.03704	.04630	.05556	.06482	.07408	.08335	.08612	.08983	.09251	.930
Y =	.78320	.75883	.74126	.73054	.70012	.67250	.64525	.61660	.58513	.54863	.50278	.43523	.40461	.34083	.17238	
X =	.00005	.00060	.00140	.00200	.00395	.00599	.00798	.00998	.01197	.01397	.01596	.01796	.01856	.01936	.01994	.970
Y =	.67176	.65086	.63579	.62660	.60000	.57688	.55344	.52887	.50188	.47057	.43124	.37330	.34704	.29234	.14785	
X =	.00000	.00000	.00000	.00000	.00000	.00001	.00001	.00001	.00001	.00002	.00002	.00002	.00002	.00002	.00002	.999
Y =	.34422	.33351	.32578	.32107	.30770	.29560	.28359	.27100	.25717	.24112	.22097	.19128	.17783	.14980	.07576	

TABLE II VALUES OF x/a , y/b AND z/c

		$\alpha = 1.40$					$\beta = 1.40$					$\gamma = 1.40$					z
X =	.00100	.03000	.07000	.10000	.15599	.29999	.39998	.49998	.59997	.69997	.79996	.89996	.92996	.96996	.99895		
Y =	.99991	.99468	.98264	.97136	.95273	.86376	.79297	.71158	.61893	.51324	.39072	.24192	.18836	.10344	.00915	.001	
X =	.00099	.02984	.06963	.09947	.19894	.29842	.39789	.49736	.59683	.69631	.79578	.89525	.92509	.96488	.99373		
Y =	.99468	.98948	.97750	.96627	.94890	.85924	.78882	.70786	.61569	.51055	.38868	.24066	.18738	.10290	.00910	.030	
X =	.00098	.02948	.06879	.09827	.19654	.29480	.39307	.49134	.58961	.68788	.78614	.88441	.91389	.95320	.98170		
Y =	.98264	.97750	.96566	.95458	.90778	.84884	.77927	.69929	.60824	.50437	.38397	.23774	.18511	.10166	.00899	.070	
X =	.00097	.02914	.06800	.09714	.19428	.29142	.38856	.48570	.58284	.67998	.77712	.87426	.90340	.94226	.97043		
Y =	.97136	.96627	.95458	.94362	.89736	.83909	.77032	.69125	.59825	.49858	.37956	.23501	.18298	.10049	.00889	.100	
X =	.00092	.02771	.06466	.09238	.18476	.27713	.36951	.46189	.55427	.64664	.73902	.83140	.85911	.89606	.92285		
Y =	.92373	.91890	.90778	.89736	.85336	.79795	.73256	.65737	.57178	.47414	.36095	.22349	.17401	.09556	.00845	.200	
X =	.00086	.02591	.06047	.08638	.17276	.25914	.34552	.43190	.51828	.60466	.69104	.77742	.80333	.83788	.86293		
Y =	.91136	.90524	.89484	.88390	.83909	.77595	.70614	.61469	.52365	.43255	.33752	.20898	.16271	.08936	.00790	.300	
X =	.00079	.02379	.05551	.07930	.15860	.23790	.31720	.39650	.47580	.55510	.63440	.71370	.73749	.76921	.79221		
Y =	.79297	.78882	.77927	.77032	.73256	.68499	.62885	.56431	.49083	.40702	.30986	.19185	.14938	.08204	.00726	.400	
X =	.00071	.02135	.04981	.07116	.14232	.21348	.28465	.35581	.42697	.49813	.56929	.64045	.66180	.69206	.71090		
Y =	.71158	.70786	.69929	.69211	.65737	.61469	.56431	.50639	.44046	.36524	.27805	.17216	.13505	.07362	.00651	.500	
X =	.00062	.01857	.04333	.06190	.12379	.18569	.24758	.30948	.37137	.43327	.49516	.55706	.57563	.60039	.61834		
Y =	.61893	.61569	.60824	.60125	.57178	.53465	.49083	.44046	.38310	.31768	.24185	.14974	.11659	.06403	.00566	.600	
X =	.00051	.01540	.03593	.05133	.10265	.15398	.20530	.25663	.30796	.35928	.41061	.46193	.47733	.49786	.51275		
Y =	.51324	.50952	.50437	.50055	.47414	.44335	.40702	.36524	.31768	.26344	.20055	.12417	.09668	.05310	.00470	.700	
X =	.00039	.01172	.02735	.03907	.07815	.11722	.15630	.19537	.23444	.27352	.31259	.35166	.36339	.37902	.39035		
Y =	.39072	.38868	.38397	.37956	.36095	.33752	.30986	.27805	.24185	.20055	.15268	.09453	.07360	.04042	.00358	.800	
X =	.00024	.00726	.01694	.02419	.04839	.07258	.09677	.12097	.14516	.16935	.19354	.21773	.22500	.23467	.24169		
Y =	.24192	.24066	.23774	.23501	.22349	.20898	.19185	.17216	.14974	.12417	.09453	.05853	.04557	.02503	.00221	.900	
X =	.00019	.00565	.01319	.01884	.03767	.05651	.07535	.09418	.11302	.13186	.15070	.16953	.17518	.18272	.18818		
Y =	.18836	.18738	.18511	.18298	.17401	.16271	.14938	.13405	.11659	.09668	.07360	.04557	.03548	.01949	.00172	.930	
X =	.00010	.00310	.00724	.01034	.02069	.03103	.04138	.05172	.06207	.07241	.08276	.09310	.09621	.10035	.10335		
Y =	.10344	.10290	.10166	.10049	.09556	.08936	.08204	.07362	.06403	.05310	.04042	.02503	.01949	.01070	.00095	.970	
X =	.00001	.00027	.00064	.00092	.00183	.00275	.00366	.00458	.00549	.00641	.00732	.00824	.00851	.00888	.00914		
Y =	.00915	.00910	.00899	.00889	.00889	.00889	.00889	.00889	.00889	.00889	.00889	.00889	.00889	.00889	.00889	.999	

		$\alpha = 1.40$					$\beta = 1.40$					$\gamma = 2.00$					z
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900		
Y =	.99995	.99472	.98268	.97140	.92378	.86380	.79300	.71161	.61895	.51326	.39074	.24193	.18837	.10345	.00915	.001	
X =	.00100	.02998	.06995	.09994	.19987	.29981	.39974	.49968	.59961	.69955	.79949	.89942	.92940	.96938	.99836		
Y =	.99931	.99408	.98205	.97077	.92318	.86324	.79249	.71116	.61856	.51293	.39049	.24178	.18825	.10338	.00915	.030	
X =	.00100	.02989	.06975	.09965	.19930	.29895	.39860	.49825	.59790	.69755	.79720	.89685	.92674	.96660	.99550		
Y =	.99645	.99124	.97924	.96800	.92054	.86077	.79022	.70912	.61679	.51146	.38937	.24108	.18771	.10309	.00912	.070	
X =	.00097	.02979	.06950	.09928	.19857	.29785	.39714	.49642	.59571	.69500	.79429	.89358	.92335	.96306	.99185		
Y =	.99280	.98761	.97565	.96445	.91717	.85762	.78733	.70652	.61453	.50959	.38794	.24020	.18702	.10271	.00909	.100	
X =	.00097	.02914	.06799	.09713	.19425	.29138	.38850	.48563	.58276	.67988	.77701	.87414	.90327	.94212	.97029		
Y =	.97122	.96614	.95444	.94348	.89723	.83897	.77021	.69116	.60117	.49851	.37951	.23498	.18296	.10048	.00889	.200	
X =	.00093	.02805	.06544	.09349	.18697	.28046	.37394	.46743	.56091	.65440	.74788	.84137	.86941	.90681	.93392		
Y =	.93481	.92992	.91866	.90812	.86360	.80752	.74134	.66525	.57863	.47982	.36528	.22617	.17610	.09671	.00855	.300	
X =	.00088	.02649	.06180	.08829	.17658	.26487	.35316	.44145	.52974	.61803	.70632	.79461	.82110	.85642	.88202		
Y =	.88286	.87825	.86761	.85765	.81561	.76265	.70014	.62829	.54648	.45316	.34498	.21360	.16631	.09134	.00808	.400	
X =	.00081	.02443	.05700	.08143	.16285	.24428	.32570	.40713	.48855	.56998	.65140	.73283	.75725	.78982	.81344		
Y =	.81421	.80995	.80015	.79096	.75219	.70335	.64570	.57943	.50398	.41792	.31816	.19699	.15338	.08423	.00745	.500	
X =	.00073	.02181	.05089	.07270	.14541	.21811	.29082	.36352	.43622	.50893	.58163	.65433	.67615	.70523	.72631		
Y =	.72701	.72320	.71445	.70624	.67162	.62801	.57654	.51737	.45000	.37316	.28408	.17589	.13695	.07521	.00665	.600	
X =	.00062	.01855	.04327	.06182	.12364	.18546	.24728	.30910	.37091	.43273	.49455	.55637	.57492	.59964	.61757		
Y =	.61816	.61493	.60748	.60051	.57107	.53399	.49022	.43991	.38263	.31729	.24155	.14956	.11645	.06395	.00566	.700	
X =	.00048	.01446	.03374	.04820	.09641	.14461	.19281	.24101	.28922	.33742	.38562	.43383	.44829	.46757	.48155		
Y =	.48201	.47949	.47368	.46824	.44525	.41638	.38225	.34302	.29835	.24741	.18835	.11662	.09080	.04987	.00441	.800	
X =	.00031	.00916	.02138	.03054	.06107	.09161	.12215	.15268	.18322	.21376	.24429	.27483	.28399	.29621	.30506		
Y =	.30535	.30376	.30008	.29663	.28209	.26378	.24216	.21730	.18901	.16773	.11932	.07388	.05752	.03159	.00279	.900	
X =	.00024	.00718	.01675	.02394	.04787	.07181	.09574	.11968	.14361	.16755	.19148	.21542	.22260	.23217	.23911		
Y =	.23934	.23809	.23521	.23251	.22111	.20675	.18981	.17033	.14815	.12235	.09352	.05791	.04509	.02476	.00219	.930	
X =	.00013	.00398	.00928	.01326	.02652	.03978	.05304	.06630	.07956	.09282	.10608	.11934	.12332	.12863	.13247		
Y =	.13260	.13191	.13031	.12881	.12250	.11454	.10516	.09436	.08208	.06806	.05181	.03208	.02498	.01372	.00121	.970	
X =	.00001	.00035	.00083	.00118	.00236	.00354	.00472	.00590	.00708	.00826	.00944	.01062	.01098	.01145	.01179		
Y =	.01180	.01174	.01160	.01147	.01090	.01020	.00936	.00840	.00731	.00606	.00461	.00286	.00222	.00122	.00011	.999	

TABLE II VALUES OF x/a , y/b AND z/c

		$\alpha = 1.40$			$\beta = 2.00$			$\gamma = 2.00$						z		
X=	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001
Y=	.99997	.99630	.98784	.97989	.94661	.90258	.85014	.78808	.71476	.62695	.51799	.37033	.31082	.20432	.03741	
X=	.00100	.02598	.06995	.09994	.19987	.29981	.39974	.49968	.59961	.69955	.79949	.89942	.92940	.96938	.99836	.030
Y=	.99952	.99586	.98740	.97945	.94559	.90218	.84976	.78773	.71444	.62667	.51776	.37016	.31068	.20423	.03740	
X=	.00100	.02589	.06975	.09965	.19930	.29895	.39860	.49825	.59790	.69755	.79720	.89685	.92674	.96660	.99550	.070
Y=	.99752	.99386	.98542	.97749	.94365	.90037	.84806	.78615	.71301	.62542	.51672	.36942	.31006	.20382	.03732	
X=	.00099	.02979	.06950	.09928	.19857	.29785	.39714	.49642	.59571	.69499	.79428	.89356	.92335	.96306	.99185	.100
Y=	.99496	.99131	.98289	.97498	.94127	.89806	.84588	.78413	.71118	.62381	.51539	.36847	.30926	.20330	.03723	
X=	.00097	.02914	.06799	.09713	.19542	.29138	.38850	.48563	.58276	.67988	.77701	.87414	.90327	.94212	.97029	.200
Y=	.97976	.97617	.96789	.96009	.92690	.88435	.83297	.77216	.70032	.61429	.50752	.36284	.30454	.20019	.03666	
X=	.00093	.02805	.06544	.09349	.18697	.28046	.37394	.46743	.56091	.65440	.74788	.84137	.86941	.90681	.93392	.300
Y=	.95391	.95041	.94234	.93476	.90244	.86101	.81098	.75178	.68184	.59808	.49413	.35327	.29650	.19491	.03569	
X=	.00088	.02649	.06180	.08829	.17658	.26487	.35316	.44145	.52974	.61803	.70632	.79461	.82110	.85820	.88202	.400
Y=	.91649	.91313	.90537	.89809	.86703	.82723	.77917	.72229	.65509	.57461	.47474	.33941	.28487	.18726	.03429	
X=	.00081	.02443	.05700	.08143	.16285	.24428	.32570	.40713	.48855	.56998	.65140	.73283	.75725	.78922	.81344	.500
Y=	.86600	.86282	.85550	.84861	.81527	.78166	.73624	.68250	.61900	.54296	.44059	.32071	.26918	.17695	.03240	
X=	.00073	.02181	.05089	.07270	.14541	.21811	.29082	.36352	.43622	.50893	.58163	.65433	.67615	.70523	.72631	.600
Y=	.79997	.79704	.79028	.78391	.75681	.72207	.68011	.63046	.57181	.50156	.41439	.29626	.24866	.16346	.02993	
X=	.00062	.01855	.04327	.06182	.12364	.18546	.24728	.30910	.37091	.43273	.49455	.55637	.57492	.59964	.61757	.700
Y=	.71412	.71150	.70546	.69978	.67559	.64457	.60712	.56280	.51044	.44774	.36992	.26447	.22197	.14591	.02672	
X=	.00048	.01446	.03374	.04820	.09641	.14461	.19281	.24101	.28922	.33742	.38562	.43383	.44829	.46757	.48155	.800
Y=	.59998	.59778	.59271	.58794	.56761	.54155	.51009	.47285	.42886	.37617	.31079	.22220	.18649	.12259	.02245	
X=	.00031	.00916	.02138	.03054	.06107	.09161	.12215	.15268	.18322	.21376	.24429	.27483	.28399	.29621	.30506	.900
Y=	.43588	.43428	.43059	.42713	.41236	.39343	.37057	.34352	.31156	.27328	.22579	.16142	.13548	.08906	.01631	
X=	.00024	.00718	.01675	.02394	.04787	.07181	.09574	.11968	.14361	.16755	.19148	.21542	.22260	.23217	.23911	.930
Y=	.36755	.36620	.36305	.36017	.34772	.33175	.31248	.28967	.26272	.23044	.19039	.13612	.11424	.07510	.01375	
X=	.00013	.00398	.00928	.01326	.02652	.04978	.07304	.09630	.11956	.14282	.16608	.18934	.19335	.12332	.12863	.970
Y=	.24310	.24221	.24015	.23822	.22598	.21942	.20667	.19159	.17376	.15242	.12593	.09003	.07556	.04967	.00909	
X=	.00001	.00035	.00083	.00118	.00236	.00354	.00472	.00590	.00708	.00826	.00944	.01062	.01098	.01145	.01179	.999
Y=	.04471	.04455	.04417	.04381	.04230	.04036	.03801	.03524	.03196	.02803	.02316	.01656	.01390	.00914	.00167	

		$\alpha = 1.40$			$\beta = 2.00$			$\gamma = 3.00$						z		
X=	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001
Y=	.99997	.99630	.98784	.97989	.94601	.90259	.85014	.78808	.71476	.62695	.51799	.37033	.31082	.20432	.03741	
X=	.00100	.03000	.07000	.10000	.20000	.29999	.39999	.49999	.59999	.69999	.79998	.89998	.92998	.96998	.99898	.030
Y=	.99995	.99629	.98783	.97988	.94600	.90257	.85013	.78807	.71475	.62694	.51798	.37032	.31081	.20432	.03741	
X=	.00100	.02599	.06998	.09998	.19995	.29993	.39990	.49988	.59985	.69983	.79980	.89978	.92977	.96976	.99876	.070
Y=	.99980	.99613	.98768	.97972	.94585	.90243	.85000	.78795	.71464	.62685	.51790	.37026	.31077	.20428	.03741	
X=	.00100	.02598	.06995	.09993	.19986	.29979	.39971	.49964	.59957	.69950	.79943	.89936	.92934	.96931	.99829	.100
Y=	.99947	.99581	.98735	.97940	.94554	.90213	.84972	.78769	.71440	.62664	.51773	.37014	.31066	.20422	.03740	
X=	.00099	.02583	.06960	.09943	.19886	.29828	.39771	.49714	.59657	.69600	.79542	.89485	.92486	.96445	.99328	.200
Y=	.99596	.99231	.98389	.97597	.94222	.89897	.84673	.78492	.71190	.62444	.51591	.36884	.30957	.20350	.03726	
X=	.00098	.02542	.06864	.09806	.19613	.29419	.39226	.49032	.58838	.68645	.78451	.88258	.91199	.95122	.97966	.300
Y=	.98638	.98276	.97442	.96657	.93315	.89032	.83859	.77737	.70505	.61843	.51095	.36529	.30659	.20154	.03690	
X=	.00095	.02526	.06677	.09539	.19377	.28616	.38154	.47693	.57231	.66770	.76308	.85847	.88709	.92524	.95290	.400
Y=	.96744	.96390	.95571	.94802	.91524	.87322	.82249	.76244	.69151	.60656	.50114	.35828	.30071	.19767	.03620	
X=	.00091	.02727	.06363	.09090	.18181	.27271	.36361	.45451	.54542	.63632	.72722	.81813	.84540	.88176	.90812	.500
Y=	.93538	.93196	.92404	.91661	.88491	.84429	.79524	.73718	.66860	.58646	.48453	.34641	.29074	.19112	.03500	
X=	.00084	.02521	.05883	.08404	.16809	.25213	.33618	.42022	.50427	.58831	.67236	.75640	.78162	.81524	.83961	.600
Y=	.88541	.88217	.87468	.86763	.83763	.79918	.75275	.69780	.63288	.55513	.45865	.32790	.27521	.18091	.03313	
X=	.00074	.02222	.05185	.07408	.14816	.22223	.29631	.37039	.44447	.51855	.59262	.66670	.68893	.71856	.74004	.700
Y=	.81053	.80756	.80070	.79426	.76680	.73160	.68909	.63878	.57935	.50818	.41986	.30017	.25194	.16561	.03033	
X=	.00060	.01797	.04193	.05990	.11980	.17971	.23961	.29951	.35941	.41932	.47922	.53912	.55709	.58105	.59842	.800
Y=	.69855	.69599	.69008	.68452	.66086	.63052	.59388	.55053	.49931	.43797	.36185	.25870	.21713	.14273	.02614	
X=	.00039	.01181	.02755	.03935	.07871	.11806	.15741	.19677	.23612	.27547	.31482	.35418	.36598	.38172	.39314	.900
Y=	.52056	.51865	.51425	.51011	.49247	.46986	.44256	.41026	.37209	.32638	.26965	.19278	.16180	.10636	.01948	
X=	.00031	.00935	.02183	.03118	.06236	.09355	.12473	.15591	.18709	.21827	.24946	.28064	.28999	.30246	.31151	.930
Y=	.44230	.44068	.43694	.43342	.41844	.39923	.37603	.34858	.31615	.27731	.22911	.16380	.13748	.09037	.01655	
X=	.00018	.00526	.01227	.01753	.03505	.05258	.07010	.08763	.10515	.12268	.14021	.15773	.16299	.17000	.17508	.970
Y=	.29550	.29442	.29192	.28957	.27556	.26672	.25123	.23289	.21122	.18527	.15307	.10944	.09185	.06038	.01106	
X=	.00002	.00047	.00110	.00158	.00315	.00473	.00631	.00788	.00946	.01103	.01261	.01419	.01466	.01529	.01575	.999
Y=	.05474	.05454	.05408	.05364	.05179	.04941	.04654	.04314	.03913	.03432	.02836	.02027	.01702	.01119	.00205	

TABLE II VALUES OF x/a , y/b AND z/c

		$\alpha = 1.40$				$\beta = 2.00$				$\gamma = 5.00$				z		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001
Y =	.99997	.99630	.98784	.97989	.94601	.90259	.85014	.78808	.71476	.62695	.51799	.37033	.31082	.20432	.03741	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.030
Y =	.99997	.99630	.98784	.97989	.94601	.90259	.85014	.78808	.71476	.62695	.51799	.37033	.31082	.20432	.03741	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.070
Y =	.99997	.99630	.98784	.97989	.94601	.90259	.85014	.78808	.71476	.62695	.51799	.37033	.31082	.20432	.03741	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.69999	.79999	.89999	.92999	.96999	.99899	.100
Y =	.99996	.99630	.98784	.97989	.94601	.90258	.85014	.78808	.71476	.62695	.51799	.37032	.31082	.20432	.03741	
X =	.00100	.02999	.06998	.09998	.19995	.29993	.39991	.49989	.59986	.69984	.79982	.89979	.92979	.96978	.99877	.200
Y =	.99981	.99614	.98769	.97974	.94586	.90244	.85001	.78795	.71465	.62685	.51791	.37027	.31077	.20429	.03741	
X =	.00100	.02995	.06988	.09983	.19952	.29948	.39931	.49913	.59896	.69878	.79861	.89844	.92839	.96832	.99727	.300
Y =	.99875	.99509	.98664	.97870	.94486	.90149	.84911	.78712	.71389	.62619	.51736	.36988	.31044	.20407	.03737	
X =	.00099	.02978	.06949	.09927	.19853	.29780	.39707	.49634	.59560	.69487	.79414	.89341	.92319	.96289	.99168	.400
Y =	.99484	.99119	.98277	.97486	.94116	.89795	.84578	.78404	.71109	.62374	.51533	.36843	.30922	.20327	.03722	
X =	.00098	.02933	.06843	.09776	.19552	.29327	.39103	.48879	.58655	.68430	.78206	.87982	.90915	.94825	.97660	.500
Y =	.98422	.98061	.97229	.96446	.93111	.88837	.83675	.77567	.70350	.61708	.50983	.36449	.30592	.20110	.03682	
X =	.00094	.02831	.06607	.09438	.18876	.28315	.37753	.47191	.56629	.66067	.75505	.84944	.87775	.91550	.94287	.600
Y =	.96030	.95678	.94866	.94102	.90849	.86678	.81642	.75682	.68861	.60209	.49744	.35564	.29849	.19621	.03593	
X =	.00088	.02631	.06138	.08768	.17537	.26305	.35074	.43842	.52610	.61379	.70147	.78915	.81546	.85053	.87596	.700
Y =	.91207	.90873	.90102	.89376	.86286	.82325	.77542	.71881	.65194	.57185	.47246	.33778	.28350	.18636	.03413	
X =	.00075	.02259	.05272	.07531	.15062	.22592	.30123	.37654	.45185	.52715	.60246	.67777	.70036	.73049	.75233	.800
Y =	.81993	.81692	.80998	.80346	.77568	.74008	.69708	.64619	.58580	.51407	.42473	.30365	.25486	.16753	.03068	
X =	.00053	.01586	.03700	.05285	.10570	.15855	.21140	.26425	.31710	.36995	.42280	.47565	.49151	.51265	.52797	.900
Y =	.63991	.63756	.63215	.62706	.60538	.57759	.54403	.50432	.45740	.40121	.33148	.23698	.19890	.13075	.02394	
X =	.00043	.01283	.02993	.04275	.08550	.12825	.17100	.21375	.25650	.29925	.34200	.38475	.39758	.41468	.42708	.930
Y =	.55163	.54961	.54494	.54055	.52186	.49791	.46898	.43474	.39429	.34586	.28575	.20429	.17146	.11271	.02064	
X =	.00025	.00741	.01730	.02471	.04942	.07413	.09884	.12355	.14826	.17297	.19769	.22240	.22981	.23969	.24686	.970
Y =	.37584	.37446	.37129	.36830	.35556	.33924	.31953	.29620	.26865	.23564	.19469	.13919	.11682	.07679	.01406	
X =	.00002	.00068	.00159	.00227	.00454	.00681	.00908	.01134	.01361	.01588	.01815	.02042	.02110	.02201	.02267	.999
Y =	.07064	.07038	.06978	.06922	.06683	.06376	.06006	.05567	.05049	.04429	.03659	.02616	.02196	.01443	.00264	

		$\alpha = 1.40$				$\beta = 3.00$				$\gamma = 3.00$				z		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001
Y =	.99998	.99753	.99188	.98655	.96368	.93395	.89742	.85319	.79942	.73253	.64498	.51569	.45885	.34690	.11186	
X =	.00100	.03000	.07000	.10000	.20000	.29999	.39999	.49999	.59999	.69999	.79998	.89998	.92998	.96998	.99898	.030
Y =	.99997	.99753	.99187	.98654	.96367	.93395	.89741	.85318	.79941	.73252	.64497	.51569	.45885	.34690	.11186	
X =	.00100	.02999	.06998	.09998	.19995	.29993	.39990	.49988	.59985	.69983	.79980	.89978	.92977	.96976	.99876	.070
Y =	.99986	.99742	.99177	.98644	.96357	.93385	.89731	.85309	.79933	.73244	.64491	.51563	.45880	.34686	.11185	
X =	.00100	.02998	.06995	.09993	.19986	.29979	.39971	.49964	.59957	.69950	.79943	.89936	.92934	.96931	.99829	.100
Y =	.99965	.99720	.99155	.98622	.96335	.93364	.89712	.85291	.79915	.73228	.64477	.51552	.45870	.34679	.11183	
X =	.00099	.02983	.06960	.09943	.19986	.29928	.39971	.49914	.59957	.69600	.79542	.89485	.92468	.96445	.99328	.200
Y =	.99731	.99487	.98923	.98391	.96110	.93146	.89502	.85091	.79728	.73057	.64326	.51431	.45762	.34597	.11156	
X =	.00098	.02942	.06864	.09806	.19613	.29419	.39226	.49032	.58838	.68645	.78451	.88258	.91199	.95122	.97966	.300
Y =	.99090	.98847	.98287	.97759	.95492	.92547	.88927	.84544	.79216	.72587	.63912	.51101	.45468	.34375	.11085	
X =	.00095	.02862	.06677	.09539	.19477	.28616	.38154	.47693	.57231	.66770	.76308	.85847	.88709	.92524	.95290	.400
Y =	.97817	.97578	.97025	.96504	.94266	.91359	.87785	.83459	.78199	.71655	.63092	.50445	.44885	.33934	.10942	
X =	.00091	.02727	.06363	.09090	.18181	.27271	.36361	.45451	.54542	.63632	.72722	.81813	.84540	.88176	.90812	.500
Y =	.95645	.95411	.94870	.94360	.92172	.89329	.85835	.81605	.76462	.70064	.61690	.49324	.43887	.33180	.10699	
X =	.00084	.02521	.05883	.08404	.16805	.25213	.33618	.42022	.50427	.58831	.67236	.75640	.78162	.81524	.83961	.600
Y =	.92207	.91981	.91460	.90968	.88859	.86119	.82750	.78672	.73713	.67545	.59473	.47551	.42310	.31987	.10315	
X =	.00074	.02222	.05185	.07408	.14816	.22223	.29631	.37039	.44447	.51855	.59262	.66670	.68893	.71856	.74004	.700
Y =	.86932	.86719	.86228	.85764	.83776	.81192	.78016	.74171	.69496	.63681	.56071	.44831	.39890	.30157	.09725	
X =	.00060	.01797	.04193	.05990	.11980	.17971	.23961	.29951	.35941	.41932	.47922	.53912	.55709	.58105	.59842	.800
Y =	.78728	.78536	.78091	.77671	.75870	.73530	.70654	.67172	.62938	.57672	.50779	.40600	.36125	.27312	.08807	
X =	.00039	.01181	.02755	.03935	.07871	.11806	.15741	.19677	.23612	.27547	.31482	.35418	.36598	.38172	.39314	.900
Y =	.64711	.64553	.64187	.63842	.62362	.60439	.58074	.55212	.51733	.47404	.41738	.33372	.29693	.22449	.07239	
X =	.00031	.00935	.02183	.03118	.06236	.09355	.12473	.15591	.18709	.21827	.24946	.28064	.28999	.30246	.31151	.930
Y =	.58051	.57909	.57581	.57272	.55944	.54218	.52097	.49530	.46408	.42525	.37443	.29937	.26637	.20139	.06494	
X =	.00018	.00526	.01227	.01753	.03505	.05258	.07010	.08763	.10515	.12268	.14021	.15773	.16299	.17000	.17508	.970
Y =	.44365	.44257	.44006	.43769	.42754	.41436	.39815	.37853	.35467	.32499	.28615	.22879	.20357	.15391	.04963	
X =	.00002	.00047	.00110	.00158	.00315	.00473	.00631	.00788	.00946	.01103	.01261	.01419	.01466	.01529	.01575	.999
Y =	.14418	.14382	.14301	.14224	.13894	.13466	.12939	.12301	.11526	.10561	.09299	.07435	.06616	.05002	.01613	

TABLE II VALUES OF x/a , y/b AND z/c

		$\alpha = 1.40$					$\beta = 3.00$					$\gamma = 5.00$					z
X=	-.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001	
Y=	.65998	.99753	.99188	.98655	.96368	.93395	.89742	.85319	.79942	.73253	.64498	.51569	.45885	.34690	.11186		
X=	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.030	
Y=	.99998	.99753	.99188	.98655	.96368	.93395	.89742	.85319	.79942	.73253	.64498	.51569	.45885	.34690	.11186		
X=	-.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.070	
Y=	.99998	.99753	.99188	.98655	.96368	.93395	.89742	.85319	.79942	.73253	.64498	.51569	.45885	.34690	.11186		
X=	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.69999	.79999	.89999	.92999	.96999	.99899	.100	
Y=	.99998	.99753	.99188	.98655	.96367	.93395	.89741	.85319	.79942	.73253	.64498	.51569	.45885	.34690	.11186		
X=	.00100	.02999	.06998	.09998	.19595	.29993	.39991	.49989	.59986	.69984	.79982	.89979	.92979	.96978	.99877	.200	
Y=	.99587	.99743	.99177	.98644	.96357	.93385	.89732	.85310	.79933	.73245	.64491	.51564	.45880	.34686	.11185		
X=	.00100	.02995	.06988	.09983	.19665	.29948	.39931	.49913	.59896	.69878	.79861	.89844	.92836	.96832	.99727	.300	
Y=	.99917	.99673	.99108	.98575	.96285	.93320	.89669	.85250	.79877	.73193	.64446	.51527	.45848	.34625	.11177		
X=	-.00099	.02978	.06949	.09927	.19853	.29780	.39707	.49634	.59560	.69487	.79414	.89341	.92319	.96289	.99168	.400	
Y=	.99655	.99412	.98848	.98317	.96038	.93076	.89434	.85027	.79668	.73002	.64277	.51393	.45728	.34571	.11148		
X=	-.00098	.02933	.06843	.09776	.19552	.29327	.39103	.48877	.58655	.68430	.78206	.87982	.90915	.94825	.97660	.500	
Y=	.98945	.98703	.98144	.97616	.95353	.92412	.88797	.84421	.79100	.72422	.63819	.51026	.45402	.34325	.11068		
X=	-.00094	.02831	.06507	.09438	.18876	.28315	.37753	.47191	.56629	.66067	.75505	.84944	.87775	.91550	.94287	.600	
Y=	.97336	.97098	.96547	.96029	.93802	.90909	.87353	.83048	.77814	.71303	.62781	.50196	.44664	.33767	.10888		
X=	.00088	.02631	.06138	.08768	.17537	.26305	.35074	.43842	.52610	.61379	.70147	.78915	.81546	.85053	.87596	.700	
Y=	.99049	.98819	.98287	.97786	.95634	.92839	.89403	.85243	.80186	.74265	.66661	.54850	.48501	.38276	.10521		
X=	-.00075	.02259	.05272	.07531	.15062	.22592	.30123	.37654	.45185	.52715	.60246	.67777	.70036	.73049	.75233	.800	
Y=	.98760	.98388	.98693	.98426	.96422	.93818	.90618	.87473	.84332	.81193	.76503	.65177	.60197	.50390	.09800		
X=	-.00053	.01586	.03700	.05285	.10572	.15855	.21140	.26425	.31710	.36995	.42280	.47565	.49151	.51265	.52797	.900	
Y=	.97425	.97077	.96350	.95761	.93652	.90955	.87662	.83358	.79055	.74752	.67896	.58295	.53074	.45261	.08307		
X=	-.00043	.01283	.02993	.04275	.08552	.12825	.17100	.21375	.25650	.29925	.34200	.38476	.39758	.41468	.42708	.930	
Y=	.96726	.96797	.96716	.96635	.94819	.92820	.90363	.87368	.83771	.79272	.73383	.64687	.60863	.52333	.07524		
X=	-.00025	.00741	.01730	.02471	.04942	.07413	.09884	.12355	.14826	.17297	.19769	.22240	.22981	.23969	.24686	.970	
Y=	.95208	.95193	.95168	.95138	.93185	.90185	.86641	.82133	.77626	.73119	.67612	.58258	.53897	.48067	.05826		
X=	-.00002	.00068	.00159	.00227	.00454	.00681	.00908	.01134	.01361	.01588	.01815	.02042	.02110	.02201	.02267	.999	
Y=	.97088	.97046	.96950	.96859	.96468	.95960	.95336	.94580	.93661	.92518	.91022	.89812	.88841	.88192	.01911		

		$\alpha = 1.40$					$\beta = 5.00$					$\gamma = 5.00$					z
X=	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001	
Y=	.99999	.99852	.99512	.99191	.97804	.95983	.93712	.90913	.87431	.82965	.76865	.67210	.62662	.52981	.26867		
X=	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.030	
Y=	.99999	.99852	.99512	.99191	.97804	.95983	.93712	.90913	.87431	.82965	.76865	.67210	.62662	.52981	.26866		
X=	-.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.070	
Y=	.99999	.99852	.99512	.99191	.97804	.95983	.93712	.90913	.87431	.82965	.76865	.67210	.62662	.52981	.26866		
X=	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.69999	.79999	.89999	.92999	.96999	.99899	.100	
Y=	.99999	.99852	.99512	.99191	.97804	.95983	.93712	.90913	.87431	.82965	.76865	.67210	.62662	.52981	.26866		
X=	.00100	.02999	.06998	.09998	.19595	.29993	.39991	.49989	.59986	.69984	.79982	.89979	.92979	.96978	.99877	.200	
Y=	.99592	.99846	.99506	.99184	.97798	.95977	.93706	.90908	.87425	.82760	.76860	.67206	.62658	.52978	.26865		
X=	.00100	.02995	.06988	.09983	.19665	.29948	.39931	.49913	.59896	.69878	.79861	.89844	.92836	.96832	.99727	.300	
Y=	.99950	.99803	.99464	.99143	.97757	.95937	.93667	.90869	.87388	.82925	.76827	.67177	.62631	.52956	.26853		
X=	-.00099	.02978	.06949	.09927	.19853	.29780	.39707	.49634	.59560	.69487	.79414	.89341	.92319	.96289	.99168	.400	
Y=	.99793	.99647	.99307	.98987	.97603	.95786	.93520	.90727	.87251	.82794	.76707	.67072	.62533	.52873	.26811		
X=	-.00098	.02933	.06843	.09776	.19552	.29327	.39103	.48877	.58655	.68430	.78206	.87982	.90915	.94825	.97660	.500	
Y=	.99366	.99220	.98882	.98563	.97185	.95376	.93119	.90338	.86877	.82440	.76378	.66795	.62265	.52646	.26696		
X=	-.00094	.02831	.06507	.09438	.18876	.28315	.37753	.47191	.56629	.66067	.75505	.84944	.87775	.91550	.94287	.600	
Y=	.98393	.98248	.97914	.97598	.96234	.94442	.92207	.89453	.86027	.81633	.75630	.66131	.61655	.52131	.26435		
X=	.00088	.02631	.06138	.08768	.17537	.26305	.35074	.43842	.52610	.61379	.70147	.78915	.81546	.85053	.87596	.700	
Y=	.99386	.99244	.99166	.99107	.97215	.95215	.93026	.90647	.87629	.84272	.79967	.74088	.64782	.60398	.51067		
X=	-.00075	.02259	.05272	.07531	.15062	.22592	.30123	.37654	.45185	.52715	.60246	.67777	.70036	.73049	.75233	.800	
Y=	.92365	.92230	.91916	.91619	.90339	.88656	.86559	.83974	.80757	.76632	.70998	.62080	.57879	.48937	.24816		
X=	-.00053	.01586	.03700	.05285	.10572	.15855	.21140	.26425	.31710	.36995	.42280	.47565	.49151	.51265	.52797	.900	
Y=	.83646	.83524	.83239	.82971	.81811	.80288	.78388	.76047	.73134	.69399	.64296	.56219	.52415	.44318	.22473		
X=	-.00043	.01283	.02993	.04275	.08552	.12825	.17100	.21375	.25650	.29925	.34200	.38476	.39758	.41468	.42708	.930	
Y=	.78824	.78708	.78440	.78187	.77094	.75659	.73869	.71662	.68917	.65397	.60589	.52978	.49393	.41763	.21177		
X=	-.00025	.00741	.01730	.02471	.04942	.07413	.09884	.12355	.14826	.17297	.19769	.22240	.22981	.23969	.24686	.970	
Y=	.67609	.67509	.67280	.67062	.64894	.63358	.61465	.59111	.56092	.51968	.45440	.38265	.35820	.28164	.05826		
X=	-.00002	.00068	.00159	.00227	.00454	.00681	.00908	.01134	.01361	.01588	.01815	.02042	.02110	.02201	.02267	.999	
Y=	.34643	.34592	.34475	.34363	.33883	.33252	.32465	.31496	.30289	.28742	.26629	.23284	.21708	.18345	.09307		

TABLE II VALUES OF x/a , y/b AND z/c

		$\alpha = 2.00$					$\beta = 2.00$					$\gamma = 2.00$					z
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001	
Y =	.99999	.99955	.99755	.99499	.97580	.95394	.91651	.86602	.80000	.71414	.60000	.43589	.36756	.24310	.04471		
X =	.00100	.02599	.06997	.09995	.19991	.29985	.39982	.49977	.59973	.69968	.79964	.89959	.92958	.96956	.99855	.030	
Y =	.99955	.99910	.99710	.99454	.97935	.95351	.91610	.86564	.79964	.71382	.59973	.43569	.36739	.24300	.04469		
X =	.00100	.02993	.06983	.09975	.15551	.29926	.39902	.49877	.59853	.69828	.79804	.89779	.92772	.96762	.99655	.070	
Y =	.99755	.99710	.99510	.99255	.97739	.95160	.91427	.86390	.79804	.71239	.59853	.43482	.36666	.24251	.04460		
X =	.00099	.02985	.06965	.09950	.15500	.29850	.39799	.49749	.59699	.69649	.79599	.89549	.92534	.96514	.99399	.100	
Y =	.99499	.99454	.99255	.99000	.97488	.94916	.91192	.86168	.79599	.71056	.59699	.43371	.36572	.24189	.04449		
X =	.00098	.02939	.06859	.09798	.15596	.29394	.39192	.48990	.58788	.68586	.78384	.88182	.91121	.95040	.97882	.200	
Y =	.97980	.97935	.97739	.97488	.96000	.93467	.89800	.84853	.78384	.69971	.58788	.42708	.36013	.23819	.04381		
X =	.00095	.02862	.06678	.09539	.15079	.28618	.38158	.47697	.57236	.66776	.76315	.85855	.88716	.92532	.95299	.300	
Y =	.95394	.95351	.95160	.94916	.93467	.91000	.87430	.82614	.75000	.65452	.54991	.43950	.33687	.22281	.04098		
X =	.00092	.02750	.06416	.09165	.18330	.27495	.36661	.45826	.54991	.64156	.73321	.82486	.85236	.88902	.91560	.400	
Y =	.91651	.91610	.91427	.91192	.89800	.87430	.84000	.79373	.73321	.65452	.54991	.43950	.33687	.22281	.04098		
X =	.00087	.02598	.06062	.08660	.17321	.25981	.34641	.43301	.51962	.60622	.69282	.77942	.80540	.84004	.86516	.500	
Y =	.86602	.86564	.86390	.86168	.84853	.82614	.79373	.75000	.69282	.61847	.51962	.37749	.31832	.21054	.03872		
X =	.00080	.02400	.05600	.08000	.16000	.24000	.32000	.40000	.48000	.56000	.64000	.72000	.74400	.77600	.79920	.600	
Y =	.80000	.79964	.79804	.79599	.78384	.76315	.73321	.69282	.64000	.57131	.48000	.34871	.29405	.19448	.03577		
X =	.00071	.02142	.04999	.07141	.14283	.21424	.28566	.35707	.42849	.49990	.57131	.64273	.66415	.69272	.71343	.700	
Y =	.71414	.71382	.71239	.71056	.69571	.68125	.65452	.61847	.57131	.51000	.42849	.31129	.26249	.17361	.03193		
X =	.00060	.01800	.04200	.06000	.12000	.18000	.24000	.30000	.36000	.42000	.48000	.54000	.55800	.58200	.59940	.800	
Y =	.60000	.59573	.59853	.59699	.58788	.57236	.54991	.51962	.48000	.42849	.36000	.26153	.22054	.14586	.02683		
X =	.00044	.01308	.03051	.04359	.08718	.13077	.17436	.21794	.26153	.30512	.34871	.39230	.40538	.42281	.43545	.900	
Y =	.43589	.43569	.43482	.43371	.42708	.41581	.39950	.37749	.34871	.31129	.26153	.19000	.16022	.10597	.01949		
X =	.00037	.01103	.02573	.03676	.07351	.11027	.14702	.18378	.22054	.25729	.29405	.33080	.34183	.35653	.36719	.930	
Y =	.36756	.36739	.36666	.36572	.36013	.35063	.33687	.31832	.29405	.26249	.22054	.16022	.13510	.08936	.01643		
X =	.00024	.00729	.01702	.02431	.04862	.07293	.09724	.12155	.14586	.17017	.19448	.21879	.22609	.23581	.24286	.970	
Y =	.24310	.24300	.24251	.24189	.23815	.23191	.22281	.21053	.19448	.17361	.14586	.10597	.08936	.05910	.01087		
X =	.00004	.00134	.00313	.00447	.00894	.01341	.01788	.02236	.02683	.03130	.03577	.04024	.04158	.04337	.04467	.999	
Y =	.04471	.04469	.04460	.04449	.04381	.04265	.04098	.03872	.03577	.03193	.02683	.01949	.01643	.01087	.00200		

		$\alpha = 2.00$					$\beta = 2.00$					$\gamma = 3.00$					z
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001	
Y =	.99999	.99955	.99755	.99499	.97580	.95394	.91651	.86603	.80000	.71414	.60000	.43589	.36756	.24310	.04471		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.39999	.49999	.59999	.69999	.79999	.89999	.92999	.96999	.99899	.030	
Y =	.99999	.99554	.99753	.99497	.97978	.95393	.91650	.86601	.79999	.71413	.59999	.43588	.36755	.24310	.04471		
X =	.00100	.02999	.06999	.09998	.15997	.29995	.39993	.49991	.59990	.69988	.79986	.89985	.92984	.96983	.99883	.070	
Y =	.99983	.99938	.99738	.99482	.97963	.95378	.91636	.86588	.79986	.71402	.59990	.43582	.36750	.24306	.04470		
X =	.00100	.02998	.06996	.09995	.15990	.29985	.39980	.49975	.59970	.69965	.79960	.89955	.92953	.96951	.99850	.100	
Y =	.99950	.99905	.99705	.99449	.97931	.95346	.91606	.86559	.79960	.71379	.59970	.43567	.36738	.24298	.04469		
X =	.00100	.02588	.06972	.09960	.19920	.29880	.39840	.49800	.59760	.69719	.79679	.89639	.92627	.96611	.99500	.200	
Y =	.99599	.99554	.99355	.99100	.97587	.95012	.91284	.86255	.79679	.71128	.59760	.43414	.36609	.24213	.04453		
X =	.00099	.02959	.06905	.09864	.19728	.29592	.39456	.49320	.59184	.69049	.78913	.88777	.91736	.95682	.98542	.300	
Y =	.98641	.98596	.98399	.98146	.96648	.94097	.90406	.85425	.78913	.70444	.59184	.42997	.36256	.23980	.04410		
X =	.00097	.02902	.06772	.09675	.19349	.29024	.38699	.48374	.58048	.67723	.77398	.87072	.89975	.93845	.96650	.400	
Y =	.96747	.96704	.96510	.96262	.94792	.92271	.88670	.83735	.77398	.69091	.58048	.42171	.35560	.23520	.04326		
X =	.00094	.02806	.06548	.09354	.18708	.28062	.37417	.46771	.56125	.65479	.74833	.84187	.86994	.90735	.93448	.500	
Y =	.93541	.93499	.93312	.93073	.91652	.89233	.85732	.81009	.74833	.66802	.56125	.40774	.34382	.22740	.04182		
X =	.00089	.02656	.06198	.08854	.17705	.26563	.35418	.44272	.53126	.61981	.70835	.79689	.82346	.85887	.88455	.600	
Y =	.88544	.88504	.88327	.88100	.86755	.84465	.81152	.76681	.70835	.63233	.53126	.38595	.32545	.21525	.03959		
X =	.00081	.02432	.05674	.08106	.16211	.24317	.32422	.40528	.48633	.56739	.64844	.72950	.75382	.78624	.80974	.700	
Y =	.81055	.81019	.80857	.80649	.79418	.77322	.74289	.70196	.64844	.57885	.48633	.35331	.29793	.19705	.03624		
X =	.00070	.02096	.04890	.06986	.13571	.20957	.27943	.34928	.41914	.48900	.55886	.62871	.64967	.67761	.69787	.800	
Y =	.69857	.69826	.69686	.69507	.68446	.66639	.64025	.60498	.55886	.49888	.41914	.30450	.25677	.16983	.03123		
X =	.00052	.01562	.03644	.05206	.10412	.15617	.20823	.26029	.31235	.36440	.41646	.46852	.48414	.50496	.52006	.900	
Y =	.52058	.52034	.51930	.51797	.51006	.49660	.47712	.45083	.41646	.37177	.31235	.22691	.19134	.12655	.03238		
X =	.00044	.01327	.03096	.04423	.08846	.13269	.17693	.22116	.26539	.30962	.35385	.39808	.41135	.42905	.44187	.930	
Y =	.44232	.44212	.44123	.44010	.43338	.42194	.40539	.38306	.35385	.31588	.26539	.19280	.16258	.10753	.01978		
X =	.00030	.00887	.02069	.02955	.05910	.08865	.11820	.14775	.17731	.20686	.23641	.26596	.27483	.28665	.29522	.970	
Y =	.29551	.29539	.29475	.29403	.28954	.28190	.27084	.25592	.23641	.21104	.17731	.12881	.10862	.07184	.01321		
X =	.00005	.00164	.00383	.00547	.01094	.01642	.02190	.02737	.03285	.03832	.04380	.04927	.05091	.05310	.05469	.999	
Y =	.05475	.05472	.05461	.05447	.05364	.05222	.05018	.04741	.04380	.03910	.03285	.02386	.02012	.01331	.00245		

TABLE II VALUES OF x/a , y/b AND z/c

		$\alpha = 2.00$				$\beta = 2.00$				$\gamma = 5.00$				z		
X=	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001
Y=	.99999	.99955	.99755	.99499	.97580	.95394	.91652	.86603	.80000	.71414	.60000	.43589	.36756	.24310	.04471	
X=	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.030
Y=	.99999	.99555	.99755	.99499	.97580	.95394	.91652	.86603	.80000	.71414	.60000	.43589	.36756	.24310	.04471	
X=	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.070
Y=	.99999	.99555	.99755	.99499	.97980	.95394	.91651	.86602	.80000	.71414	.60000	.43589	.36756	.24310	.04471	
X=	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99899	.100
Y=	.99999	.99594	.99754	.99498	.97579	.95393	.91651	.86602	.80000	.71414	.60000	.43589	.36756	.24310	.04471	
X=	.00100	.03000	.06999	.09998	.19997	.29995	.39994	.49992	.59990	.69989	.79987	.89986	.92985	.96984	.99884	.200
Y=	.99984	.99539	.99739	.99483	.97564	.95379	.91637	.86584	.79987	.71403	.59990	.43582	.36750	.24307	.04470	
X=	.00100	.02596	.06991	.09988	.19976	.29964	.39951	.49939	.59927	.69915	.79903	.89891	.92887	.96882	.99779	.300
Y=	.99878	.95833	.99633	.99378	.97860	.95278	.91540	.86497	.79903	.71327	.59927	.43536	.36711	.24281	.04466	
X=	.00099	.02985	.06964	.09949	.19897	.29846	.39795	.49743	.59692	.69641	.79589	.89538	.92523	.96502	.99387	.400
Y=	.99487	.95442	.99243	.98988	.97477	.94904	.91181	.86158	.79589	.71048	.59692	.43365	.36567	.24186	.04448	
X=	.00098	.02953	.06939	.09924	.19855	.29785	.39730	.49673	.59615	.69558	.79498	.89438	.92415	.96387	.99267	.500
Y=	.99425	.98381	.98184	.97932	.96437	.93892	.90208	.85239	.78740	.70290	.59055	.42903	.36177	.23928	.04401	
X=	.00096	.02881	.06722	.09603	.19207	.28810	.38413	.48017	.57620	.67223	.76827	.86430	.89311	.93152	.95937	.600
Y=	.96033	.95990	.95798	.95552	.94093	.91610	.88016	.83167	.76827	.68582	.57620	.41860	.35298	.23346	.04294	
X=	.00091	.02736	.06385	.09121	.18242	.27363	.36484	.45605	.54726	.63847	.72968	.82089	.84825	.88474	.91119	.700
Y=	.91210	.91169	.90986	.90753	.89367	.87009	.83596	.78990	.72968	.65137	.54726	.43958	.35252	.22174	.04078	
X=	.00082	.02460	.05740	.08200	.16359	.24599	.32798	.40998	.49197	.57397	.65596	.73796	.76255	.79535	.81913	.800
Y=	.81995	.81958	.81794	.81584	.80338	.78218	.75150	.71010	.65996	.58556	.49197	.35741	.30138	.19933	.03666	
X=	.00064	.01920	.04480	.06399	.12795	.19198	.25597	.31996	.38396	.44795	.51194	.57594	.59513	.62073	.63929	.900
Y=	.63993	.63964	.63836	.63672	.62700	.61045	.58651	.55420	.51194	.45700	.38396	.27894	.23521	.15557	.02861	
X=	.00055	.01655	.03862	.05516	.11033	.16549	.22066	.27582	.33099	.38615	.44132	.49648	.51303	.53510	.55109	.930
Y=	.55164	.55140	.55029	.54888	.54050	.52624	.50559	.47774	.44132	.39395	.33099	.24046	.20276	.13411	.02466	
X=	.00038	.01128	.02631	.03759	.07517	.11276	.15034	.18793	.22551	.26310	.30068	.33827	.34954	.36458	.37548	.970
Y=	.37585	.37568	.37493	.37397	.36826	.35854	.34448	.32551	.30068	.26841	.22551	.16383	.13915	.09137	.01680	
X=	.00007	.00212	.00494	.00706	.01413	.02119	.02826	.03532	.04238	.04945	.05651	.06358	.06570	.06852	.07057	.999
Y=	.07064	.07061	.07047	.07029	.06921	.06739	.06474	.06118	.05651	.05045	.04238	.03079	.02596	.01717	.00316	

		$\alpha = 2.00$				$\beta = 3.00$				$\gamma = 3.00$				z		
X=	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001
Y=	.99999	.99570	.99836	.99666	.98648	.96905	.94354	.90856	.86177	.79896	.71138	.57489	.51312	.38952	.12597	
X=	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99899	.030
Y=	.99999	.99569	.99835	.99665	.98648	.96904	.94353	.90855	.86177	.79895	.71137	.57488	.51311	.38952	.12597	
X=	.00100	.02999	.06999	.09998	.19997	.29995	.39993	.49991	.59990	.69988	.79986	.89985	.92584	.96983	.99883	.070
Y=	.99989	.99599	.99825	.99654	.98637	.96894	.94343	.90846	.86168	.79887	.71130	.57482	.51306	.38947	.12596	
X=	.00100	.02998	.06996	.09995	.19992	.29985	.39980	.49975	.59970	.69965	.79960	.89955	.92554	.96951	.99850	.100
Y=	.99967	.99937	.99803	.99632	.98616	.96873	.94322	.90826	.86149	.79869	.71114	.57470	.51295	.38939	.12593	
X=	.00100	.02588	.06972	.09960	.19920	.29880	.39840	.49800	.59760	.69719	.79679	.89639	.92627	.96611	.99500	.200
Y=	.99733	.99703	.99565	.99399	.98385	.96646	.94102	.90613	.85947	.79682	.70948	.57335	.51175	.38848	.12564	
X=	.00099	.02959	.06950	.09946	.19928	.29922	.39916	.49910	.59904	.69898	.79892	.89886	.92585	.96982	.99881	.300
Y=	.99092	.99062	.98930	.98760	.97753	.96025	.93497	.90031	.85395	.79170	.70492	.56967	.50846	.38598	.12483	
X=	.00097	.02902	.06772	.09675	.19349	.29024	.38699	.48374	.58048	.67723	.77398	.87072	.89975	.93845	.96650	.400
Y=	.97819	.97750	.97659	.97492	.96497	.94792	.92296	.88875	.84298	.78154	.69587	.56235	.50193	.38103	.12322	
X=	.00094	.02806	.06548	.09354	.18708	.28062	.37417	.46771	.56125	.65479	.74833	.84187	.86994	.90735	.93448	.500
Y=	.95647	.95618	.95490	.95327	.94354	.92686	.90246	.86901	.82426	.76417	.68041	.54986	.49078	.37256	.12049	
X=	.00089	.02656	.06198	.08854	.17709	.26563	.35418	.44272	.53126	.61981	.70835	.79689	.82346	.85887	.88455	.600
Y=	.92209	.92181	.92058	.91900	.90963	.89355	.87003	.83777	.79463	.73671	.65595	.53010	.47314	.35917	.11616	
X=	.00081	.02432	.05674	.08106	.16211	.24317	.32422	.40528	.48633	.56739	.64844	.72950	.75382	.78624	.80974	.700
Y=	.86934	.86908	.86792	.86643	.85759	.84243	.82025	.78985	.74917	.69456	.61843	.49977	.44607	.33862	.10951	
X=	.00070	.02096	.04890	.06986	.13571	.20957	.27943	.34928	.41914	.48900	.55886	.62871	.64967	.67761	.69787	.800
Y=	.78730	.78706	.78601	.78467	.77666	.76293	.74285	.71531	.67847	.62902	.56007	.45261	.40398	.30667	.09918	
X=	.00052	.01562	.03644	.05206	.10412	.15617	.20823	.26029	.31235	.36440	.41646	.46852	.48414	.50496	.52006	.900
Y=	.64713	.64693	.64607	.64496	.63838	.62710	.61059	.58795	.55768	.51703	.46035	.37203	.33205	.25207	.08152	
X=	.00044	.01327	.03096	.04423	.08846	.13269	.17693	.22116	.26539	.30962	.35385	.39808	.41135	.42905	.44187	.930
Y=	.58053	.58035	.57958	.57858	.57268	.56256	.54775	.52744	.50028	.46382	.41297	.33374	.29788	.22613	.07313	
X=	.00030	.00887	.02069	.02955	.05910	.08865	.11820	.14775	.17730	.20685	.23640	.26595	.27483	.28665	.29522	.970
Y=	.44366	.44353	.44293	.44218	.43766	.42993	.41861	.40309	.38233	.35446	.31561	.25506	.22765	.17261	.05509	
X=	.00005	.00164	.00383	.00547	.01095	.01642	.02190	.02737	.03285	.03832	.04380	.04927	.05091	.05310	.05464	.999
Y=	.14418	.14413	.14394	.14370	.14223	.13972	.13604	.13099	.12425	.11519	.10257	.08289	.07398	.05616	.01816	

TABLE II VALUES OF x/a , y/b AND z/c

		$\alpha = 2.00$				$\beta = 3.00$				$\gamma = 5.00$				Z		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001
Y =	.99999	.95570	.99836	.99666	.98648	.96905	.94354	.90856	.86177	.79896	.71138	.57489	.51312	.38952	.12597	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.030
Y =	.99999	.95570	.99836	.99666	.98648	.96905	.94354	.90856	.86177	.79896	.71138	.57489	.51312	.38952	.12597	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.070
Y =	.99999	.95570	.99836	.99666	.98648	.96905	.94354	.90856	.86177	.79896	.71138	.57489	.51312	.38952	.12597	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.100
Y =	.99999	.95570	.99836	.99666	.98648	.96905	.94354	.90856	.86177	.79896	.71138	.57489	.51312	.38952	.12597	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.200
Y =	.99999	.95559	.99826	.99655	.98637	.96895	.94344	.90846	.86168	.79887	.71130	.57483	.51306	.38948	.12596	
X =	.00100	.02996	.06991	.09988	.15976	.29964	.39951	.49939	.59927	.69915	.79903	.89891	.92887	.96882	.99779	.300
Y =	.99919	.95889	.99755	.99585	.98569	.96827	.94277	.90782	.86108	.79831	.71080	.57442	.51270	.38920	.12587	
X =	.00099	.02985	.06964	.09949	.15897	.29846	.39795	.49743	.59692	.69641	.79589	.89538	.92532	.96502	.99387	.400
Y =	.99957	.95628	.99494	.99324	.98311	.96573	.94031	.90545	.85882	.79622	.70894	.57292	.51136	.38819	.12554	
X =	.00098	.02953	.06890	.09843	.19685	.29528	.39370	.49213	.59055	.68898	.78740	.88583	.91535	.95472	.98327	.500
Y =	.98947	.98918	.98785	.98616	.97610	.95885	.93361	.89900	.85270	.79055	.70389	.56884	.50772	.38542	.12465	
X =	.00096	.02881	.06722	.09630	.19207	.28810	.38413	.48017	.57620	.67223	.76827	.86430	.89311	.93152	.95937	.600
Y =	.97338	.97509	.97179	.97012	.96022	.94325	.91842	.88437	.83883	.77769	.69244	.55958	.49946	.37915	.12262	
X =	.00091	.02736	.06385	.09121	.18242	.27363	.36484	.45605	.54726	.63847	.72968	.82089	.84825	.88474	.91119	.700
Y =	.94051	.94023	.93897	.93736	.92780	.91140	.88741	.85451	.81050	.75143	.66906	.54069	.48259	.36635	.11848	
X =	.00082	.02460	.05740	.08200	.16399	.24599	.32798	.40998	.49197	.57397	.65596	.73796	.76255	.79535	.81913	.800
Y =	.87604	.87578	.87461	.87311	.86420	.84893	.82658	.79594	.75495	.69942	.62320	.50363	.44951	.34124	.11036	
X =	.00064	.01920	.04480	.06399	.12799	.19198	.25597	.31996	.38396	.44795	.51194	.57594	.59513	.62073	.63929	.900
Y =	.74260	.74238	.74138	.74012	.73256	.71962	.70067	.67470	.63995	.59331	.52827	.42691	.39104	.28926	.09355	
X =	.00055	.01655	.03862	.05516	.11033	.16549	.22066	.27582	.33099	.38615	.44132	.49648	.51303	.53510	.55109	.930
Y =	.67262	.67242	.67152	.67038	.66353	.65181	.63465	.61112	.57965	.53740	.47849	.38669	.34514	.26200	.08473	
X =	.00038	.01128	.02631	.03759	.07517	.11276	.15034	.18793	.22551	.26310	.30068	.33827	.34954	.36458	.37548	.970
Y =	.52081	.52065	.51996	.51907	.51377	.50469	.49140	.47319	.44882	.41610	.37049	.29941	.26724	.20287	.06561	
X =	.00007	.00212	.00494	.00706	.01413	.02119	.02826	.03532	.04238	.04945	.05651	.06358	.06570	.06852	.07057	.999
Y =	.17089	.17083	.17061	.17031	.16858	.16560	.16124	.15526	.14726	.13653	.12156	.09824	.08768	.06656	.02153	

		$\alpha = 2.00$				$\beta = 5.00$				$\gamma = 5.00$				Z		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001
Y =	.99999	.95582	.99902	.99799	.99187	.98131	.96573	.94409	.91461	.87401	.81519	.71738	.67009	.56796	.28851	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.030
Y =	.99999	.95582	.99902	.99799	.99187	.98131	.96573	.94409	.91461	.87401	.81519	.71738	.67009	.56796	.28851	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.070
Y =	.99999	.95582	.99902	.99799	.99187	.98131	.96573	.94409	.91461	.87400	.81519	.71738	.67009	.56796	.28851	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.100
Y =	.99999	.95582	.99902	.99799	.99187	.98131	.96573	.94409	.91461	.87400	.81519	.71738	.67009	.56796	.28851	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.200
Y =	.99994	.99576	.99895	.99793	.99181	.98125	.96567	.94403	.91455	.87395	.81514	.71734	.67004	.56792	.28849	
X =	.00100	.02996	.06991	.09988	.15976	.29964	.39951	.49939	.59927	.69915	.79903	.89891	.92887	.96882	.99779	.300
Y =	.99951	.95533	.99853	.99751	.99139	.98084	.96526	.94363	.91417	.87358	.81480	.71703	.66976	.56768	.28837	
X =	.00099	.02985	.06964	.09949	.15897	.29846	.39795	.49743	.59692	.69641	.79589	.89538	.92532	.96502	.99387	.400
Y =	.99794	.95776	.99696	.99594	.98983	.97930	.96374	.94215	.91273	.87221	.81352	.71591	.66871	.56679	.28792	
X =	.00098	.02953	.06890	.09843	.19685	.29528	.39370	.49213	.59055	.68898	.78740	.88583	.91535	.95472	.98327	.500
Y =	.99367	.95349	.99269	.99168	.98595	.97510	.95962	.93811	.90882	.86847	.81003	.71284	.66585	.56436	.28669	
X =	.00096	.02881	.06722	.09630	.19207	.28810	.38413	.48017	.57620	.67223	.76827	.86430	.89311	.93152	.95937	.600
Y =	.98394	.98276	.98297	.98196	.97594	.96556	.95022	.92893	.89992	.85997	.80210	.70586	.65933	.55884	.28338	
X =	.00091	.02736	.06385	.09121	.18242	.27363	.36484	.45605	.54726	.63847	.72968	.82089	.84825	.88474	.91119	.700
Y =	.96387	.96369	.96292	.96193	.95603	.94586	.93084	.90998	.88156	.84243	.78574	.69146	.64587	.54744	.27809	
X =	.00082	.02460	.05740	.08200	.16399	.24599	.32798	.40998	.49197	.57397	.65596	.73796	.76255	.79535	.81913	.800
Y =	.92367	.92350	.92276	.92181	.91616	.90641	.89201	.87202	.84479	.80729	.75297	.66262	.61894	.52461	.26649	
X =	.00064	.01920	.04480	.06399	.12799	.19198	.25597	.31996	.38396	.44795	.51194	.57594	.59513	.62073	.63929	.900
Y =	.83647	.83632	.83565	.83480	.82567	.82085	.80781	.78971	.76505	.73108	.68189	.60007	.56051	.47508	.24133	
X =	.00055	.01655	.03862	.05516	.11033	.16549	.22066	.27582	.33099	.38615	.44132	.49648	.51303	.53510	.55109	.930
Y =	.78825	.78811	.78748	.78667	.78184	.77352	.76124	.74418	.72094	.68893	.64258	.56548	.52820	.44769	.22742	
X =	.00038	.01128	.02631	.03759	.07517	.11276	.15034	.18793	.22551	.26310	.30068	.33827	.34954	.36458	.37548	.970
Y =	.67609	.67597	.67543	.67474	.67060	.66346	.65293	.63829	.61836	.59091	.55115	.48502	.43304	.38399	.19506	
X =	.00007	.00212	.00494	.00706	.01413	.02119	.02826	.03532	.04238	.04945	.05651	.06358	.06570	.06852	.07057	.999
Y =	.34644	.34637	.34610	.34574	.34362	.33996	.33456	.32707	.31685	.30279	.28241	.24853	.23214	.19676	.09995	

TABLE II VALUES OF x/a , y/b AND z/c

		$\alpha = 3.00$					$\beta = 3.00$					$\gamma = 3.00$					z
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001	
Y =	.99999	.99599	.99889	.99967	.99733	.99092	.97819	.95647	.92209	.86934	.78730	.64713	.58053	.44366	.14418		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.59999	.69999	.79999	.89999	.92999	.96999	.99899	.030	
Y =	.99999	.99598	.99888	.99966	.99732	.99091	.97819	.95646	.92208	.86933	.78729	.64712	.58052	.44366	.14418		
X =	.00100	.03000	.06599	.09999	.15558	.29997	.39995	.49994	.59993	.69992	.79991	.89990	.92989	.96989	.99889	.070	
Y =	.99989	.99588	.99977	.99955	.99721	.99080	.97808	.95636	.92198	.86924	.78721	.64705	.58046	.44361	.14416		
X =	.00100	.02999	.06998	.09997	.19993	.29990	.39987	.49983	.59980	.69977	.79973	.89970	.92969	.96968	.99867	.100	
Y =	.99967	.99566	.99955	.99933	.99699	.99059	.97787	.95615	.92178	.86905	.78704	.64691	.58033	.44358	.14413		
X =	.00100	.02992	.06981	.09973	.19947	.29920	.39893	.49866	.59840	.69813	.79786	.89759	.92751	.96747	.99633	.200	
Y =	.99733	.99732	.99721	.99699	.99466	.98827	.97558	.95391	.91962	.86701	.78519	.64540	.57897	.44247	.14379		
X =	.00099	.02973	.06936	.09909	.19818	.29728	.39637	.49546	.59455	.69364	.79273	.89183	.92155	.96119	.98993	.300	
Y =	.99092	.99091	.99080	.99058	.98827	.98188	.96931	.94778	.91371	.86144	.78015	.64125	.57525	.43963	.14287		
X =	.00098	.02935	.06847	.09782	.19564	.29346	.39128	.48910	.58692	.68474	.78256	.88038	.90972	.94885	.97722	.400	
Y =	.97819	.97819	.97808	.97787	.97558	.96931	.95686	.93561	.90198	.85038	.77013	.63302	.56787	.43399	.14103		
X =	.00096	.02869	.06695	.09565	.19125	.28694	.38259	.47823	.57388	.66953	.76517	.86082	.88951	.92777	.95551	.500	
Y =	.95647	.95646	.95636	.95615	.95391	.94778	.93561	.91483	.88194	.83149	.75302	.61896	.55525	.42434	.13790		
X =	.00092	.02766	.06455	.09221	.18442	.27663	.36883	.46104	.55325	.64546	.73767	.82988	.85754	.89442	.92117	.600	
Y =	.92209	.92208	.92198	.92178	.91962	.91371	.90198	.88194	.85024	.80161	.72596	.59671	.53530	.40909	.13294		
X =	.00087	.02608	.06085	.08863	.17387	.26080	.34774	.43467	.52160	.60854	.69547	.78240	.80848	.84326	.86847	.700	
Y =	.86934	.86933	.86924	.86905	.86701	.86144	.85038	.83149	.80161	.75575	.68443	.56257	.50467	.38569	.12534		
X =	.00079	.02362	.05511	.07873	.15746	.23619	.31492	.39365	.47238	.55111	.62984	.70857	.73219	.76368	.78651	.800	
Y =	.78730	.78729	.78721	.78704	.78519	.78015	.77013	.75302	.72596	.68443	.61984	.50948	.45705	.34929	.11351		
X =	.00065	.01941	.04530	.06471	.12543	.19414	.25885	.32356	.38828	.45299	.51770	.58241	.60183	.62777	.64648	.900	
Y =	.64713	.64712	.64705	.64691	.64546	.64125	.63302	.61896	.59671	.56257	.50948	.41877	.37567	.28710	.09330		
X =	.00058	.01742	.04064	.05805	.11611	.17416	.23221	.29026	.34832	.40637	.46442	.52247	.53989	.56311	.57995	.930	
Y =	.58053	.58052	.58046	.58033	.57897	.57525	.56787	.55925	.53530	.50467	.45705	.37567	.33701	.25756	.08370		
X =	.00044	.01331	.03106	.04437	.08873	.13310	.17746	.22183	.26620	.31056	.35493	.39929	.41260	.43035	.44322	.970	
Y =	.44366	.44366	.44361	.44351	.44247	.43963	.43399	.42434	.40909	.38569	.34929	.28710	.25756	.19683	.06397		
X =	.00014	.00433	.01009	.01442	.02884	.04325	.05767	.07209	.08651	.10092	.11534	.12976	.13409	.13985	.14403	.999	
Y =	.14418	.14418	.14416	.14413	.14379	.14287	.14103	.13790	.13294	.12534	.11351	.09330	.08370	.06397	.02079		

		$\alpha = 3.00$					$\beta = 3.00$					$\gamma = 5.00$					z
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001	
Y =	.99999	.99599	.99889	.99967	.99733	.99092	.97819	.95647	.92209	.86934	.78730	.64713	.58053	.44366	.14418		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.030	
Y =	.99999	.99599	.99889	.99967	.99733	.99092	.97819	.95647	.92209	.86934	.78730	.64713	.58053	.44366	.14418		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.070	
Y =	.99999	.99599	.99889	.99967	.99733	.99092	.97819	.95647	.92209	.86934	.78730	.64713	.58053	.44366	.14418		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.100	
Y =	.99999	.99599	.99889	.99967	.99733	.99092	.97819	.95646	.92208	.86933	.78730	.64713	.58052	.44366	.14418		
X =	.00100	.03000	.06999	.09999	.19998	.29997	.39996	.49995	.59994	.69993	.79991	.89990	.92989	.96989	.99889	.200	
Y =	.99989	.99588	.99978	.99956	.99722	.99081	.97809	.95636	.92199	.86924	.78722	.64706	.58046	.44361	.14416		
X =	.00100	.02558	.06994	.09992	.19984	.29976	.39968	.49959	.59951	.69943	.79935	.89927	.92525	.96921	.99819	.300	
Y =	.99919	.99518	.99908	.99886	.99652	.99011	.97740	.95569	.92134	.86863	.78666	.64660	.58006	.44330	.14406		
X =	.00100	.02990	.06976	.09966	.19531	.29897	.39863	.49829	.59794	.69760	.79726	.89692	.92681	.96668	.99558	.400	
Y =	.99657	.99657	.99646	.99624	.99391	.98752	.97484	.95319	.91893	.86636	.78460	.64491	.57854	.44214	.14368		
X =	.00099	.02968	.06926	.05895	.19785	.29684	.39579	.49474	.59368	.69263	.79158	.89053	.92021	.95979	.98848	.500	
Y =	.98947	.98946	.98936	.98914	.98683	.98049	.96790	.94640	.91238	.86019	.77901	.64032	.57441	.43899	.14266		
X =	.00097	.02520	.06814	.09734	.19468	.29201	.38935	.48669	.58403	.68136	.77870	.87604	.90524	.94418	.97240	.600	
Y =	.97338	.97337	.97327	.97305	.97077	.96454	.95215	.93100	.89754	.84619	.76634	.62990	.56507	.43185	.14034		
X =	.00094	.02822	.06584	.09405	.18810	.28215	.37620	.47025	.56430	.65836	.75241	.84646	.87467	.91229	.93957	.700	
Y =	.94051	.94050	.94040	.94019	.93799	.93197	.92000	.89956	.86723	.81762	.74046	.60863	.54599	.41727	.13560		
X =	.00088	.02628	.06132	.08760	.17521	.26281	.35042	.43802	.52563	.61323	.70083	.78844	.81472	.84976	.87517	.800	
Y =	.87604	.87603	.87594	.87575	.87370	.86809	.85694	.83790	.80779	.76158	.68971	.56691	.50857	.38866	.12631		
X =	.00074	.02228	.05198	.07426	.14852	.22278	.29704	.37130	.44556	.51982	.59408	.66834	.69062	.72032	.74186	.900	
Y =	.74260	.74259	.74251	.74235	.74061	.73586	.72641	.71027	.68474	.64557	.58465	.48056	.43110	.32946	.10707		
X =	.00067	.02018	.04708	.06726	.13452	.20179	.26905	.33631	.40357	.47084	.53810	.60536	.62554	.65245	.67195	.930	
Y =	.67262	.67262	.67255	.67240	.67083	.66652	.65796	.64334	.62022	.58474	.52956	.43527	.39048	.29842	.09698		
X =	.00052	.01562	.03646	.05208	.10416	.15624	.20832	.26040	.31249	.36457	.41665	.46873	.48435	.50519	.52029	.970	
Y =	.52081	.52081	.52075	.52064	.51942	.51608	.50945	.49814	.48023	.45276	.41003	.33703	.30234	.23106	.07509		
X =	.00017	.00513	.01196	.01709	.03418	.05127	.06835	.08544	.10253	.11962	.13671	.15380	.15892	.16576	.17071	.999	
Y =	.17089	.17088	.17087	.17083	.17043	.16933	.16716	.16345	.15757	.14856	.13454	.11058	.09920	.07581	.02464		

TABLE II VALUES OF x/α , y/b AND z/c

		$\alpha = 3.00$			$\beta = 5.00$			$\gamma = 5.00$					z			
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001
Y =	.99999	.95999	.99993	.99980	.99835	.99454	.98686	.97365	.95250	.91942	.86633	.77018	.72159	.61409	.31285	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.030
Y =	.99999	.95599	.99993	.99980	.99839	.99454	.98686	.97365	.95250	.91942	.86633	.77018	.72159	.61409	.31285	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.070
Y =	.99999	.95999	.99993	.99980	.99839	.99454	.98686	.97365	.95250	.91942	.86633	.77018	.72159	.61409	.31285	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.100
Y =	.99999	.95999	.99993	.99980	.99835	.99454	.98686	.97365	.95249	.91942	.86633	.77018	.72159	.61409	.31285	
X =	.00100	.03000	.06999	.05999	.19998	.29997	.39496	.49995	.59994	.69993	.79991	.89990	.92990	.96990	.99889	.200
Y =	.99994	.95993	.99987	.99974	.99833	.99440	.98680	.97358	.95244	.91936	.86628	.77013	.72155	.61405	.31283	
X =	.00100	.02998	.06994	.09992	.15584	.29976	.39968	.49959	.59951	.69943	.79935	.89927	.92925	.96921	.99819	.300
Y =	.99951	.95951	.99944	.99931	.99791	.99406	.98638	.97317	.95203	.91897	.86591	.76981	.72124	.61379	.31270	
X =	.00100	.02990	.06976	.09966	.15531	.29957	.39863	.49829	.59794	.69760	.79726	.89692	.92681	.96668	.99558	.400
Y =	.99794	.95794	.99788	.99774	.99634	.99250	.98483	.97164	.95054	.91753	.86455	.76860	.72011	.61282	.31221	
X =	.00099	.02968	.06926	.05895	.19785	.29684	.39579	.49474	.59368	.69263	.79158	.89053	.92021	.95979	.98848	.500
Y =	.99367	.99367	.99360	.99347	.99208	.98825	.98061	.96748	.94647	.91360	.86085	.76531	.71703	.61020	.31087	
X =	.00097	.02920	.06814	.05734	.19468	.29201	.38935	.48669	.58403	.68136	.77870	.87604	.90524	.94418	.97240	.600
Y =	.98394	.98394	.98387	.98374	.98236	.97857	.97101	.95801	.93720	.90465	.85242	.75781	.71001	.60422	.30783	
X =	.00094	.02822	.06584	.04905	.18810	.28215	.37620	.47025	.56430	.65836	.75241	.84646	.87467	.91229	.93957	.700
Y =	.96387	.96386	.96380	.96367	.96232	.95861	.95120	.93847	.91808	.88620	.83503	.74235	.69552	.59190	.30155	
X =	.00088	.02628	.06132	.08760	.17521	.26281	.35042	.43802	.52563	.61323	.70083	.78844	.81472	.84721	.87517	.800
Y =	.92367	.92366	.92360	.92348	.92218	.91862	.91153	.89933	.88799	.84924	.80020	.71139	.66615	.56721	.28897	
X =	.00074	.02228	.05198	.07426	.14852	.22278	.29704	.37130	.44556	.51982	.59408	.66834	.69062	.72032	.74186	.900
Y =	.83647	.83647	.83642	.83631	.83513	.83191	.82548	.81443	.79674	.76907	.72466	.64424	.60360	.51367	.26169	
X =	.00067	.02018	.04708	.06726	.13452	.20179	.26905	.33631	.40357	.47084	.53810	.60536	.62554	.65485	.67195	.930
Y =	.78825	.78825	.78820	.78809	.78658	.78395	.77789	.76748	.75080	.72473	.68289	.60710	.56880	.48405	.24661	
X =	.00052	.01562	.03646	.05208	.10416	.15624	.20832	.26040	.31249	.36457	.41665	.46873	.48435	.50519	.52029	.970
Y =	.67609	.67609	.67605	.67596	.67501	.67240	.66721	.65828	.64398	.62161	.58572	.52072	.48787	.41518	.21152	
X =	.00017	.00513	.01196	.01709	.03418	.05127	.06835	.08544	.10253	.11962	.13671	.15380	.15892	.16576	.17071	.999
Y =	.34644	.34644	.34641	.34637	.34588	.34454	.34188	.33731	.32998	.31852	.30013	.26682	.24599	.21274	.10838	

		$\alpha = 5.00$			$\beta = 5.00$			$\gamma = 5.00$					z			
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001
Y =	.99999	.95599	.99999	.99999	.99994	.99951	.99794	.99367	.98394	.96387	.92367	.83647	.78825	.67609	.34644	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.030
Y =	.99999	.95599	.99999	.99999	.99994	.99951	.99794	.99367	.98394	.96387	.92367	.83647	.78825	.67609	.34644	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.070
Y =	.99999	.95999	.99999	.99999	.99994	.99951	.99794	.99367	.98394	.96387	.92367	.83647	.78825	.67609	.34644	
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.100
Y =	.99999	.95999	.99999	.99999	.99994	.99951	.99794	.99367	.98394	.96387	.92366	.83647	.78825	.67609	.34644	
X =	.00100	.03000	.07000	.09999	.19999	.29998	.39997	.49997	.59996	.69996	.79995	.89994	.92994	.96994	.99894	.200
Y =	.99994	.95594	.99994	.99993	.99587	.99495	.99788	.99361	.98388	.96381	.92361	.83642	.78820	.67605	.34642	
X =	.00100	.02999	.06997	.09995	.15595	.29985	.39981	.49976	.59971	.69966	.79961	.89956	.92955	.96953	.99851	.300
Y =	.99951	.95951	.99951	.99951	.99545	.99490	.99746	.99319	.98346	.96340	.92322	.83607	.78817	.67577	.34627	
X =	.00100	.02994	.06986	.09979	.19959	.29938	.39918	.49897	.59877	.69856	.79835	.89815	.92809	.96801	.99695	.400
Y =	.99794	.99794	.99794	.99794	.99788	.99746	.99589	.99163	.93192	.96189	.92177	.83475	.78663	.67470	.34572	
X =	.00099	.02581	.06956	.09937	.19873	.29810	.39747	.49684	.59620	.69557	.79494	.89430	.92411	.96386	.99268	.500
Y =	.99367	.99367	.99367	.99367	.99367	.99319	.99163	.98738	.97771	.95777	.91782	.83118	.78326	.67182	.34424	
X =	.00098	.02952	.06888	.05839	.19679	.29518	.39358	.49197	.59036	.68876	.78715	.88555	.91506	.95442	.98296	.600
Y =	.98394	.98394	.98394	.98394	.98388	.98346	.98192	.97771	.96814	.94839	.90883	.82304	.77559	.66524	.34087	
X =	.00096	.02892	.06747	.09639	.19577	.28916	.38855	.48793	.58732	.68671	.78610	.88548	.91529	.95465	.98309	.700
Y =	.96387	.96387	.96387	.96387	.96387	.96340	.96189	.95777	.94839	.92904	.89029	.80625	.75977	.65167	.33392	
X =	.00092	.02771	.06666	.09237	.18473	.27710	.36947	.46183	.55420	.64657	.73893	.83130	.85901	.89596	.92274	.800
Y =	.92367	.92367	.92367	.92366	.92361	.92322	.92177	.91782	.90883	.89029	.85136	.77262	.72808	.62449	.31999	
X =	.00084	.02509	.05855	.08365	.16725	.25084	.33443	.41802	.50161	.58520	.66879	.75238	.77792	.81138	.83564	.900
Y =	.83647	.83647	.83647	.83647	.83642	.83607	.83475	.83118	.82304	.80625	.77262	.69969	.65935	.56554	.28978	
X =	.00079	.02365	.05518	.07882	.15765	.23647	.31530	.39412	.47295	.55177	.63060	.70942	.73307	.76460	.78746	.930
Y =	.78825	.78825	.78825	.78825	.78820	.78787	.78663	.78326	.77559	.75977	.72808	.65935	.62134	.53293	.27308	
X =	.00068	.02028	.04733	.06761	.13522	.20283	.27044	.33805	.40566	.47327	.54088	.60849	.62773	.65581	.67542	.970
Y =	.67609	.67609	.67609	.67609	.67605	.67577	.67404	.67182	.66524	.64737	.62449	.56554	.53293	.45710	.23422	
X =	.00035	.01039	.02425	.03464	.06929	.10393	.13857	.17322	.20786	.24251	.27715	.31179	.32219	.33604	.34609	.999
Y =	.34644	.34644	.34644	.34644	.34641	.34627	.34572	.34424	.34087	.33392	.31999	.28979	.27308	.23422	.12002	

TABLE II VALUES OF x/a , y/b AND z/c

		$\alpha = 5.00$					$\beta = 5.00$					$\gamma = 10.0$					z
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001	
Y =	.99999	.95599	.99999	.95999	.99994	.99951	.99794	.99367	.98394	.96387	.92367	.83647	.78825	.67609	.34644		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.030	
Y =	.99999	.95599	.99999	.95999	.99994	.99951	.99794	.99367	.98394	.96387	.92367	.83647	.78825	.67609	.34644		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.070	
Y =	.99999	.95599	.99999	.95999	.99994	.99951	.99794	.99367	.98394	.96387	.92367	.83647	.78825	.67609	.34644		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.100	
Y =	.99999	.95599	.99999	.95999	.99994	.99951	.99794	.99367	.98394	.96387	.92367	.83647	.78825	.67609	.34644		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.200	
Y =	.99999	.95599	.99999	.95999	.99994	.99951	.99794	.99367	.98394	.96387	.92367	.83647	.78825	.67609	.34644		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.300	
Y =	.99999	.95599	.99999	.95999	.99994	.99951	.99794	.99367	.98394	.96387	.92367	.83647	.78825	.67609	.34644		
X =	.00100	.03000	.07000	.10000	.20000	.29999	.39999	.49999	.59999	.69999	.79998	.89998	.92998	.96998	.99988	.400	
Y =	.99998	.99998	.99998	.99998	.99998	.99952	.99949	.99792	.99365	.98392	.96385	.92365	.83646	.78823	.67608		
X =	.00100	.02999	.06999	.05998	.19996	.29994	.39992	.49990	.59988	.69986	.79984	.89982	.92982	.96981	.99980	.500	
Y =	.99980	.99980	.99980	.99980	.99980	.99932	.99932	.99775	.99375	.98375	.96368	.92349	.83631	.78810	.67596		
X =	.00100	.02596	.06992	.09988	.15976	.29964	.39952	.49939	.59927	.69915	.79903	.89891	.92887	.96882	.99779	.600	
Y =	.99879	.95879	.99879	.95879	.99872	.99830	.99673	.99247	.98275	.96270	.92255	.83546	.78729	.67528	.34602		
X =	.00092	.02983	.06960	.09943	.15886	.29829	.39771	.49714	.59657	.69600	.79543	.89486	.92469	.96446	.99329	.700	
Y =	.99429	.99429	.99429	.99428	.99422	.99380	.99224	.98799	.98732	.95836	.91839	.83169	.78375	.67223	.34446		
X =	.00098	.02933	.06843	.09775	.19551	.29326	.39102	.48877	.58652	.68428	.78203	.87978	.90911	.94821	.97656	.800	
Y =	.97754	.97754	.97754	.97754	.97748	.97706	.97553	.97135	.96184	.94222	.90292	.81769	.77054	.66091	.33865		
X =	.00092	.02753	.06425	.09178	.18356	.27535	.36713	.45891	.55069	.64248	.73426	.82604	.85358	.89029	.91691	.900	
Y =	.91782	.91782	.91782	.91782	.91776	.91738	.91594	.91201	.90308	.88466	.84776	.76774	.72347	.62054	.31797		
X =	.00088	.02628	.06132	.08761	.17521	.26282	.35042	.43803	.52563	.61324	.70085	.78845	.81473	.84978	.87518	.930	
Y =	.87606	.87606	.87606	.87606	.87600	.87563	.87426	.87051	.86199	.84440	.80919	.73280	.69055	.59230	.30350		
X =	.00077	.02296	.05357	.07653	.15307	.22960	.30613	.38267	.45920	.53573	.61227	.68880	.71176	.74237	.76457	.970	
Y =	.76533	.76533	.76533	.76533	.76528	.76496	.76376	.76049	.75304	.73768	.70691	.64018	.60327	.51744	.26514		
X =	.00040	.01193	.02784	.03978	.07555	.11933	.15910	.19888	.23865	.27843	.31820	.35798	.36991	.38582	.39735	.999	
Y =	.39775	.39775	.39775	.39775	.39773	.39756	.39693	.39523	.39136	.38338	.36739	.33271	.31353	.26892	.13779		

		$\alpha = 10.0$					$\beta = 10.0$					$\gamma = 10.0$					z
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.001	
Y =	.99999	.95599	.99999	.95999	.99999	.99999	.99999	.99990	.99939	.99714	.98871	.95803	.93598	.87483	.63068		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.030	
Y =	.99999	.95599	.99999	.95999	.99999	.99999	.99999	.99990	.99939	.99714	.98871	.95803	.93598	.87483	.63068		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.070	
Y =	.99999	.95599	.99999	.95999	.99999	.99999	.99999	.99990	.99939	.99714	.98871	.95803	.93598	.87483	.63068		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.100	
Y =	.99999	.95599	.99999	.95999	.99999	.99999	.99999	.99990	.99939	.99714	.98871	.95803	.93598	.87483	.63068		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.200	
Y =	.99999	.95599	.99999	.95999	.99999	.99999	.99999	.99990	.99939	.99714	.98871	.95803	.93598	.87483	.63068		
X =	.00100	.03000	.07000	.10000	.20000	.30000	.40000	.50000	.60000	.70000	.80000	.90000	.93000	.97000	.99900	.300	
Y =	.99999	.95599	.99999	.95999	.99999	.99999	.99999	.99990	.99939	.99714	.98870	.95803	.93598	.87483	.63067		
X =	.00100	.02000	.07000	.10000	.20000	.30000	.40000	.49999	.59999	.69999	.79999	.89999	.92999	.96999	.99899	.400	
Y =	.99999	.99999	.99999	.99999	.99999	.99999	.99998	.99989	.99938	.99713	.98870	.95802	.93597	.87482	.63067		
X =	.00100	.03000	.06999	.05999	.19998	.29997	.39996	.49995	.59994	.69993	.79992	.89991	.92991	.96991	.99890	.500	
Y =	.99990	.99990	.99990	.99990	.99990	.99990	.99989	.99980	.99930	.99704	.98861	.95794	.93589	.87475	.63061		
X =	.00100	.02598	.06996	.09994	.15988	.29982	.39976	.49970	.59964	.69958	.79951	.89945	.92944	.96941	.99839	.600	
Y =	.99939	.95539	.99939	.95939	.99939	.99939	.99938	.99930	.99879	.99653	.98811	.95745	.93541	.87430	.63029		
X =	.00100	.02991	.06980	.09971	.15943	.29914	.39886	.49857	.59828	.69800	.79771	.89742	.92734	.96722	.99614	.700	
Y =	.99714	.99714	.99714	.99714	.99714	.99713	.99704	.99653	.99429	.98588	.95529	.91782	.89330	.83233	.62887		
X =	.00099	.02966	.06921	.09887	.19774	.29661	.39548	.49435	.59322	.69209	.79096	.88983	.91950	.95904	.98772	.800	
Y =	.98871	.98871	.98871	.98871	.98871	.98870	.98870	.98861	.98811	.98588	.97754	.94721	.92541	.86495	.62355		
X =	.00096	.02874	.06706	.09580	.19161	.28741	.38321	.47902	.57482	.67062	.76642	.86223	.89097	.92929	.95707	.900	
Y =	.95803	.95803	.95803	.95803	.95803	.95803	.95802	.95794	.95745	.95529	.94721	.91782	.89330	.83812	.60420		
X =	.00094	.02808	.06552	.09360	.18720	.28079	.37439	.46799	.56159	.65519	.74878	.84238	.87046	.90790	.93504	.930	
Y =	.93598	.93598	.93598	.93598	.93598	.93598	.93597	.93589	.93541	.93310	.92541	.89670	.87606	.81883	.59030		
X =	.00087	.02625	.06124	.08748	.17497	.26245	.34993	.43742	.52490	.61238	.69987	.78735	.81360	.84859	.87316	.970	
Y =	.87483	.87483	.87483	.87483	.87483	.87482	.87482	.87475	.87430	.87233	.86495	.83812	.81883	.76533	.55174		
X =	.00063	.01892	.04415	.06307	.12614	.18920	.25227	.31534	.37841	.44147	.50454	.56761	.58653	.61176	.63004	.999	
Y =	.63068	.63068	.63068	.63068	.63068	.63068	.63067	.63061	.63029	.62887	.62355	.60421	.59030	.55174	.39775		

TABLE III GEOMETRICAL AND INERTIAL CHARACTERISTICS OF GENERAL SOLIDS

$\frac{b}{a}$	$\frac{c}{a}$	$\frac{V_{vg}}{a^3}$	$\frac{\bar{x}_{vg}}{a}$	$\frac{\bar{y}_{vg}}{b}$	$\frac{\bar{z}_{vg}}{c}$	$\frac{I_{xvg}}{\rho a^5}$	$\frac{I_{yvg}}{\rho a^5}$	$\frac{I_{zvg}}{\rho a^5}$	
.10	.10	.67725-03	.16783 00	.16783 00	.24609 00	.97227-05	.36275-04	.36015-04	$\alpha = 0.50$ $\beta = 0.50$ $\gamma = 2.00$
.25	.20	.33862-02	.16783 00	.16783 00	.24509 00	.23457-04	.19061-03	.18944-03	
.50	.25	.84556-02	.16783 00	.16783 00	.24609 00	.15954-03	.49384-03	.55718-03	
.50	.50	.16931-01	.16783 00	.16783 00	.24609 00	.60767-03	.12763-02	.11144-02	
1.00	.10	.67725-02	.16783 00	.16783 00	.24609 00	.36275-03	.36275-03	.71319-03	
1.00	.20	.13545-01	.16783 00	.16783 00	.24509 00	.75244-03	.76244-03	.14254-02	
1.00	1.00	.67725-01	.16783 00	.16783 00	.24609 00	.97227-02	.97227-02	.71319-02	
1.00	2.00	.13545 00	.16783 00	.16783 00	.24609 00	.56385-01	.56385-01	.14264-01	
.10	.10	.89011-03	.17763 00	.17763 00	.29545 00	.16286-05	.52857-04	.52263-04	$\alpha = 0.50$ $\beta = 0.50$ $\gamma = 3.00$
.25	.20	.44505-02	.17763 00	.17763 00	.29545 00	.38393-04	.28095-03	.27490-03	
.50	.25	.11126-01	.17763 00	.17763 00	.29545 00	.24851-03	.73353-03	.80853-03	
.50	.50	.22253-01	.17763 00	.17763 00	.29545 00	.10179-02	.19881-02	.16171-02	
1.00	.10	.89011-02	.17763 00	.17763 00	.29545 00	.52857-03	.52857-03	.10349-02	
1.00	.20	.17802-01	.17763 00	.17763 00	.29545 00	.11238-02	.11238-02	.20598-02	
1.00	1.00	.89011-01	.17763 00	.17763 00	.29545 00	.16286-01	.16286-01	.10349-01	
1.00	2.00	.17802 00	.17763 00	.17763 00	.29545 00	.99238-01	.99238-01	.20698-01	
.10	.10	.15763-02	.24958 00	.24538 00	.24538 00	.29547-05	.16623-03	.16623-03	$\alpha = 0.50$ $\beta = 1.40$ $\gamma = 1.40$
.25	.20	.78914-02	.24958 00	.24538 00	.24538 00	.75715-04	.85334-03	.86996-03	
.50	.25	.19703-01	.24958 00	.24538 00	.24538 00	.57710-03	.21749-02	.25211-02	
.50	.50	.39407-01	.24958 00	.24538 00	.24538 00	.18467-02	.50423-02	.50423-02	
1.00	.10	.15763-01	.24958 00	.24538 00	.24538 00	.14921-02	.16623-02	.31249-02	
1.00	.20	.31526-01	.24958 00	.24538 00	.24538 00	.30729-02	.34133-02	.62499-02	
1.00	1.00	.15763 00	.24958 00	.24538 00	.24538 00	.29547-01	.31249-01	.31249-01	
1.00	2.00	.31526 00	.24958 00	.24538 00	.24538 00	.14774 00	.15114 00	.62499-01	
.10	.10	.20440-02	.27304 00	.25451 00	.28308 00	.44751-05	.25140-03	.25102-03	$\alpha = 0.50$ $\beta = 1.40$ $\gamma = 2.00$
.25	.20	.10220-01	.27304 00	.25451 00	.28308 00	.11256-03	.12334-02	.13089-02	
.50	.25	.25549-01	.27304 00	.25451 00	.28308 00	.83010-03	.33016-02	.37528-02	
.50	.50	.51099-01	.27304 00	.25451 00	.28308 00	.27969-02	.77399-02	.75056-02	
1.00	.10	.20440-01	.27304 00	.25451 00	.28308 00	.20743-02	.25140-02	.45398-02	
1.00	.20	.40879-01	.27304 00	.25451 00	.28308 00	.42941-02	.51734-02	.90735-02	
1.00	1.00	.20440 00	.27304 00	.25451 00	.28308 00	.44751-01	.49147-01	.45398-01	
1.00	2.00	.40879 00	.27304 00	.25451 00	.28308 00	.23500 00	.24390 00	.90795-01	
.10	.10	.25546-02	.29367 00	.26221 00	.32610 00	.65646-05	.35590-03	.35475-03	$\alpha = 0.50$ $\beta = 1.40$ $\gamma = 3.00$
.25	.20	.12773-01	.29367 00	.26221 00	.32610 00	.16175-03	.18373-02	.18448-02	
.50	.25	.31933-01	.29367 00	.26221 00	.32610 00	.11474-02	.47019-02	.52465-02	
.50	.50	.63865-01	.29367 00	.26221 00	.32610 00	.41029-02	.11212-01	.10493-01	
1.00	.10	.25546-01	.29367 00	.26221 00	.32610 00	.27458-02	.35590-02	.62276-02	
1.00	.20	.51092-01	.29367 00	.26221 00	.32610 00	.57231-02	.73494-02	.12455-01	
1.00	1.00	.25546 00	.29367 00	.26221 00	.32610 00	.65646-01	.73778-01	.62276-01	
1.00	2.00	.51092 00	.29367 00	.26221 00	.32610 00	.36274 00	.37900 00	.12455 00	
.10	.10	.26180-02	.30000 00	.29103 00	.29103 00	.65450-05	.37727-03	.37727-03	$\alpha = 0.50$ $\beta = 2.00$ $\gamma = 2.00$
.25	.20	.13090-01	.30000 00	.29103 00	.29103 00	.15772-03	.19354-02	.19723-02	
.50	.25	.32725-01	.30000 00	.29103 00	.29103 00	.12783-02	.49307-02	.56975-02	
.50	.50	.65450-01	.30000 00	.29103 00	.29103 00	.40905-02	.11395-01	.11395-01	
1.00	.10	.26180-01	.30000 00	.29103 00	.29103 00	.33052-02	.37727-02	.70125-02	
1.00	.20	.52360-01	.30000 00	.29103 00	.29103 00	.68068-02	.77418-02	.14025-01	
1.00	1.00	.26180 00	.30000 00	.29103 00	.29103 00	.65450-01	.70125-01	.70125-01	
1.00	2.00	.52360 00	.30000 00	.29103 00	.29103 00	.32725 00	.33660 00	.14025 00	
.10	.10	.32393-02	.32384 00	.29769 00	.33259 00	.93045-05	.53141-03	.53055-03	$\alpha = 0.50$ $\beta = 2.00$ $\gamma = 3.00$
.25	.20	.16196-01	.32384 00	.29769 00	.33259 00	.23362-03	.27332-02	.27537-02	
.50	.25	.40491-01	.32384 00	.29769 00	.33259 00	.17172-02	.69759-02	.78994-02	
.50	.50	.80982-01	.32384 00	.29769 00	.33259 00	.58153-02	.16333-01	.15799-01	
1.00	.10	.32393-01	.32384 00	.29769 00	.33259 00	.42759-02	.53141-02	.94884-02	
1.00	.20	.64785-01	.32384 00	.29769 00	.33259 00	.88565-02	.10933-01	.18977-01	
1.00	1.00	.32393 00	.32384 00	.29769 00	.33259 00	.93045-01	.10343 00	.94884-01	
1.00	2.00	.64785 00	.32384 00	.29769 00	.33259 00	.49085 00	.51161 00	.18977 00	
.10	.10	.39749-02	.35065 00	.33801 00	.33801 00	.12857-04	.74433-03	.74433-03	$\alpha = 0.50$ $\beta = 3.00$ $\gamma = 3.00$
.25	.20	.19875-01	.35065 00	.33801 00	.33801 00	.32945-03	.38181-02	.38904-02	
.50	.25	.49687-01	.35065 00	.33801 00	.33801 00	.25112-02	.97260-02	.11233-01	
.50	.50	.99373-01	.35065 00	.33801 00	.33801 00	.80357-02	.22465-01	.22465-01	
1.00	.10	.39749-01	.35065 00	.33801 00	.33801 00	.64929-02	.74433-02	.13808-01	
1.00	.20	.79499-01	.35065 00	.33801 00	.33801 00	.13371-01	.15272-01	.27615-01	
1.00	1.00	.39749 00	.35065 00	.33801 00	.33801 00	.12857 00	.13808 00	.13808 00	
1.00	2.00	.79499 00	.35065 00	.33801 00	.33801 00	.64286 00	.66187 00	.27615 00	

TABLE III GEOMETRICAL AND INERTIAL CHARACTERISTICS OF GENERAL SOLIDS

$\frac{b}{a}$	$\frac{c}{a}$	$\frac{V_{vg}}{a^3}$	$\frac{\bar{x}_{vg}}{a}$	$\frac{\bar{y}_{vg}}{b}$	$\frac{\bar{z}_{vg}}{c}$	$\frac{I_{xvg}}{\rho a^5}$	$\frac{I_{yvg}}{\rho a^5}$	$\frac{I_{zvg}}{\rho a^5}$	
.10	.10	.47552-02	.37458 00	.34251 00	.38419 00	.17525-04	.99506-03	.99332-03	$a=0.50$ $\beta=3.00$ $\gamma=5.00$
.25	.20	.23776-01	.37458 00	.34251 00	.38419 00	.43928-03	.51198-02	.51738-02	
.50	.25	.59440-01	.37458 00	.34261 00	.38419 00	.32187-02	.13071-01	.14784-01	
.50	.50	.11888 00	.37458 00	.34261 00	.38419 00	.10953-01	.30657-01	.29568-01	
1.00	.10	.47552-01	.37458 00	.34251 00	.38419 00	.79878-02	.99506-02	.17745-01	
1.00	.20	.95104-01	.37458 00	.34261 00	.38419 00	.16554-01	.20479-01	.35491-01	
1.00	1.00	.47552 00	.37458 00	.34261 00	.38419 00	.17525 00	.19488 00	.17746 00	
1.00	2.00	.95104 00	.37458 00	.34251 00	.38419 00	.92853 00	.96778 00	.35491 00	
.10	.10	.56557-02	.40107 00	.38752 00	.38752 00	.23303-04	.13243-02	.13243-02	$a=0.50$ $\beta=5.00$ $\gamma=5.00$
.25	.20	.28278-01	.40107 00	.38752 00	.38752 00	.59713-03	.67964-02	.69275-02	
.50	.25	.70696-01	.40107 00	.38752 00	.38752 00	.45513-02	.17319-01	.20050-01	
.50	.50	.14139 00	.40107 00	.38752 00	.38752 00	.14564-01	.40099-01	.40099-01	
1.00	.10	.56557-01	.40107 00	.38752 00	.38752 00	.11768-01	.13243-01	.24778-01	
1.00	.20	.11311 00	.40107 00	.38752 00	.38752 00	.24235-01	.27186-01	.49556-01	
1.00	1.00	.56557 00	.40107 00	.38752 00	.38752 00	.23303 00	.24778 00	.24778 00	
1.00	2.00	.11311 01	.40107 00	.38752 00	.38752 00	.11651 01	.11945 01	.49556 00	
.10	.10	.33049-02	.31632 00	.31632 00	.31632 00	.98707-05	.49847-03	.49847-03	$a=1.40$ $\beta=1.40$ $\gamma=1.40$
.25	.20	.16525-01	.31632 00	.31632 00	.31632 00	.25294-03	.25664-02	.26219-02	
.50	.25	.41311-01	.31632 00	.31632 00	.31632 00	.19279-02	.65547-02	.77115-02	
.50	.50	.82623-01	.31632 00	.31632 00	.31632 00	.61692-02	.15423-01	.15423-01	
1.00	.10	.33049-01	.31632 00	.31632 00	.31632 00	.49847-02	.49847-02	.98707-02	
1.00	.20	.66098-01	.31632 00	.31632 00	.31632 00	.10265-01	.10265-01	.19741-01	
1.00	1.00	.33049 00	.31632 00	.31632 00	.31632 00	.98707-01	.98707-01	.98707-01	
1.00	2.00	.66098 00	.31632 00	.31632 00	.31632 00	.49353 00	.49353 00	.19741 00	
.10	.10	.39277-02	.33343 00	.33343 00	.34399 00	.13156-04	.65170-03	.65144-03	$a=1.40$ $\beta=1.40$ $\gamma=2.00$
.25	.20	.19639-01	.33343 00	.33343 00	.34399 00	.33568-03	.33591-02	.34265-02	
.50	.25	.49096-01	.33343 00	.33343 00	.34399 00	.25395-02	.85863-02	.10078-01	
.50	.50	.98193-01	.33343 00	.33343 00	.34399 00	.82223-02	.20315-01	.20156-01	
1.00	.10	.39277-01	.33343 00	.33343 00	.34399 00	.65170-02	.65170-02	.12900-01	
1.00	.20	.78554-01	.33343 00	.33343 00	.34399 00	.13435-01	.13436-01	.25800-01	
1.00	1.00	.39277 00	.33343 00	.33343 00	.34399 00	.13156 00	.13156 00	.12900 00	
1.00	2.00	.78554 00	.33343 00	.33343 00	.34399 00	.66547 00	.66547 00	.25800 00	
.10	.10	.45672-02	.34837 00	.34837 00	.37528 00	.17120-04	.82031-03	.81942-03	$a=1.40$ $\beta=1.40$ $\gamma=3.00$
.25	.20	.22836-01	.34837 00	.34837 00	.37528 00	.43368-03	.42357-02	.43100-02	
.50	.25	.57090-01	.34837 00	.34837 00	.37528 00	.32390-02	.10845-01	.12677-01	
.50	.50	.11418 00	.34837 00	.34837 00	.37528 00	.10700-01	.25912-01	.25353-01	
1.00	.10	.45672-01	.34837 00	.34837 00	.37528 00	.82031-02	.82031-02	.16226-01	
1.00	.20	.91344-01	.34837 00	.34837 00	.37528 00	.16947-01	.16947-01	.32452-01	
1.00	1.00	.45672 00	.34837 00	.34837 00	.37528 00	.17120 00	.17120 00	.16226 00	
1.00	2.00	.91344 00	.34837 00	.34837 00	.37528 00	.88284 00	.88284 00	.32452 00	
.10	.10	.52208-02	.36154 00	.36154 00	.41098 00	.21955-04	.10029-02	.10007-02	$a=1.40$ $\beta=1.40$ $\gamma=5.00$
.25	.20	.26104-01	.36154 00	.36154 00	.41098 00	.55057-03	.51951-02	.52638-02	
.50	.25	.65260-01	.36154 00	.36154 00	.41098 00	.40375-02	.13326-01	.15482-01	
.50	.50	.13052 00	.36154 00	.36154 00	.41098 00	.13722-01	.32300-01	.30963-01	
1.00	.10	.52208-01	.36154 00	.36154 00	.41098 00	.10029-01	.10029-01	.19817-01	
1.00	.20	.10442 00	.36154 00	.36154 00	.41098 00	.20780-01	.20780-01	.39633-01	
1.00	1.00	.52208 00	.36154 00	.36154 00	.41098 00	.21955 00	.21955 00	.19817 00	
1.00	2.00	.10442 01	.36154 00	.36154 00	.41098 00	.11619 01	.11619 01	.39633 00	
.10	.10	.45815-02	.35294 00	.35850 00	.35850 00	.16879-04	.84144-03	.84144-03	$a=1.40$ $\beta=2.00$ $\gamma=2.00$
.25	.20	.22907-01	.35294 00	.35850 00	.35850 00	.43253-03	.43338-02	.44287-02	
.50	.25	.57269-01	.35294 00	.35850 00	.35850 00	.32967-02	.11072-01	.13050-01	
.50	.50	.11454 00	.35294 00	.35850 00	.35850 00	.10549-01	.26100-01	.26100-01	
1.00	.10	.45815-01	.35294 00	.35850 00	.35850 00	.85240-02	.84144-02	.16770-01	
1.00	.20	.91630-01	.35294 00	.35850 00	.35850 00	.17554-01	.17335-01	.33539-01	
1.00	1.00	.45815 00	.35294 00	.35850 00	.35850 00	.16879 00	.16770 00	.16770 00	
1.00	2.00	.91630 00	.35294 00	.35850 00	.35850 00	.84396 00	.84177 00	.33539 00	
.10	.10	.52443-02	.37013 00	.37114 00	.38686 00	.21242-04	.10486-02	.10480-02	$a=1.40$ $\beta=2.00$ $\gamma=3.00$
.25	.20	.26222-01	.37013 00	.37114 00	.38686 00	.54064-03	.54074-02	.55101-02	
.50	.25	.65554-01	.37013 00	.37114 00	.38686 00	.40719-02	.13827-01	.16189-01	
.50	.50	.13111 00	.37013 00	.37114 00	.38686 00	.13276-01	.32785-01	.32375-01	
1.00	.10	.52443-01	.37013 00	.37114 00	.38686 00	.10402-01	.10486-01	.20669-01	
1.00	.20	.10489 00	.37013 00	.37114 00	.38686 00	.21461-01	.21630-01	.41339-01	
1.00	1.00	.52443 00	.37013 00	.37114 00	.38686 00	.21242 00	.21327 00	.20669 00	
1.00	2.00	.10489 01	.37013 00	.37114 00	.38686 00	.10818 01	.10835 01	.41339 00	

TABLE III GEOMETRICAL AND INERTIAL CHARACTERISTICS OF GENERAL SOLIDS

$\frac{b}{a}$	$\frac{c}{a}$	$\frac{V_{vg}}{a^3}$	$\frac{\bar{x}_{vg}}{a}$	$\frac{\bar{y}_{vg}}{b}$	$\frac{\bar{z}_{vg}}{c}$	$\frac{I_{xvg}}{\rho a^5}$	$\frac{I_{yvg}}{\rho a^5}$	$\frac{I_{zvg}}{\rho a^5}$	
.10	.10	.59147-02	.38541 00	.38226 00	.41923 00	.26427-04	.12713-02	.12694-02	$\alpha=1.40$ $\beta=2.00$ $\gamma=5.00$
.25	.20	.29574-01	.38541 00	.38226 00	.41923 00	.66635-03	.65591-02	.66584-02	
.50	.25	.73934-01	.38541 00	.38226 00	.41923 00	.49356-02	.16822-01	.19542-01	
.50	.50	.14787 00	.38541 00	.38226 00	.41923 00	.16517-01	.40289-01	.39034-01	
1.00	.10	.59147-01	.38541 00	.38226 00	.41923 00	.12391-01	.12713-01	.24821-01	
1.00	.20	.11829 00	.38541 00	.38226 00	.41923 00	.25633-01	.26277-01	.49641-01	
1.00	1.00	.59147 00	.38541 00	.38226 00	.41923 00	.26427 00	.26749 00	.24821 00	
1.00	2.00	.11829 01	.38541 00	.38226 00	.41923 00	.13792 01	.13857 01	.49641 00	
.10	.10	.59236-02	.38947 00	.39693 00	.39693 00	.25952-04	.12954-02	.12954-02	$\alpha=1.40$ $\beta=3.00$ $\gamma=3.00$
.25	.20	.29618-01	.38947 00	.39693 00	.39693 00	.66501-03	.66718-02	.68178-02	
.50	.25	.74044-01	.38947 00	.39693 00	.39693 00	.50687-02	.17044-01	.20036-01	
.50	.50	.14809 00	.38947 00	.39693 00	.39693 00	.16220-01	.40171-01	.40171-01	
1.00	.10	.59236-01	.38947 00	.39693 00	.39693 00	.13106-01	.12954-01	.25800-01	
1.00	.20	.11847 00	.38947 00	.39693 00	.39693 00	.26990-01	.26687-01	.51601-01	
1.00	1.00	.59236 00	.38947 00	.39693 00	.39693 00	.25952 00	.25800 00	.25800 00	
1.00	2.00	.11847 01	.38947 00	.39693 00	.39693 00	.12976 01	.12946 01	.51601 00	
.10	.10	.66046-02	.40679 00	.40578 00	.42639 00	.31425-04	.15597-02	.15584-02	$\alpha=1.40$ $\beta=3.00$ $\gamma=5.00$
.25	.20	.33023-01	.40679 00	.40578 00	.42639 00	.79807-03	.80439-02	.81879-02	
.50	.25	.82557-01	.40679 00	.40578 00	.42639 00	.59878-02	.20570-01	.24002-01	
.50	.50	.16511 00	.40679 00	.40578 00	.42639 00	.19640-01	.48804-01	.48005-01	
1.00	.10	.66046-01	.40679 00	.40578 00	.42639 00	.15237-01	.15597-01	.30507-01	
1.00	.20	.13209 00	.40679 00	.40578 00	.42639 00	.31454-01	.32175-01	.61014-01	
1.00	1.00	.66046 00	.40679 00	.40578 00	.42639 00	.31425 00	.31785 00	.30507 00	
1.00	2.00	.13209 01	.40679 00	.40578 00	.42639 00	.16096 01	.16168 01	.61014 00	
.10	.10	.72911-02	.42608 00	.43267 00	.43267 00	.37122-04	.18656-02	.18656-02	$\alpha=1.40$ $\beta=5.00$ $\gamma=5.00$
.25	.20	.36456-01	.42608 00	.43267 00	.43267 00	.95125-03	.96066-02	.99154-02	
.50	.25	.91139-01	.42608 00	.43267 00	.43267 00	.72504-02	.24538-01	.28889-01	
.50	.50	.18228 00	.42608 00	.43267 00	.43267 00	.23201-01	.57777-01	.57777-01	
1.00	.10	.72911-01	.42608 00	.43267 00	.43267 00	.18747-01	.18656-01	.37032-01	
1.00	.20	.14582 00	.42608 00	.43267 00	.43267 00	.38607-01	.38426-01	.74054-01	
1.00	1.00	.72911 00	.42608 00	.43267 00	.43267 00	.37122 00	.37032 00	.37032 00	
1.00	2.00	.14582 01	.42608 00	.43267 00	.43267 00	.18561 01	.18543 01	.74054 00	
.10	.10	.52360-02	.37500 00	.37500 00	.37500 00	.20944-04	.10577-02	.10577-02	$\alpha=2.00$ $\beta=2.00$ $\gamma=2.00$
.25	.20	.26180-01	.37500 00	.37500 00	.37500 00	.53669-03	.54454-02	.55632-02	
.50	.25	.65450-01	.37500 00	.37500 00	.37500 00	.40906-02	.13908-01	.16362-01	
.50	.50	.13090 00	.37500 00	.37500 00	.37500 00	.13090-01	.32725-01	.32725-01	
1.00	.10	.52360-01	.37500 00	.37500 00	.37500 00	.10577-01	.10577-01	.20944-01	
1.00	.20	.10472 00	.37500 00	.37500 00	.37500 00	.21782-01	.21782-01	.41888-01	
1.00	1.00	.52360 00	.37500 00	.37500 00	.37500 00	.20944 00	.20944 00	.20944 00	
1.00	2.00	.10472 01	.37500 00	.37500 00	.37500 00	.10472 01	.10472 01	.41888 00	
.10	.10	.58905-02	.38952 00	.38952 00	.40000 00	.25712-04	.12753-02	.12749-02	$\alpha=2.00$ $\beta=2.00$ $\gamma=3.00$
.25	.20	.29452-01	.38952 00	.38952 00	.40000 00	.65625-03	.65730-02	.67057-02	
.50	.25	.73631-01	.38952 00	.38952 00	.40000 00	.49672-02	.16801-01	.19723-01	
.50	.50	.14726 00	.38952 00	.38952 00	.40000 00	.16070-01	.39737-01	.39445-01	
1.00	.10	.58905-01	.38952 00	.38952 00	.40000 00	.12753-01	.12753-01	.25245-01	
1.00	.20	.11781 00	.38952 00	.38952 00	.40000 00	.26292-01	.26292-01	.50490-01	
1.00	1.00	.58905 00	.38952 00	.38952 00	.40000 00	.25712 00	.25712 00	.25245 00	
1.00	2.00	.11781 01	.38952 00	.38952 00	.40000 00	.12996 01	.12996 01	.50490 00	
.10	.10	.65450-02	.40243 00	.40243 00	.42857 00	.31237-04	.15039-02	.15024-02	$\alpha=2.00$ $\beta=2.00$ $\gamma=5.00$
.25	.20	.32725-01	.40243 00	.40243 00	.42857 00	.79209-03	.77647-02	.79023-02	
.50	.25	.81812-01	.40243 00	.40243 00	.42857 00	.59267-02	.19872-01	.23242-01	
.50	.50	.16362 00	.40243 00	.40243 00	.42857 00	.19523-01	.47414-01	.46484-01	
1.00	.10	.65450-01	.40243 00	.40243 00	.42857 00	.15039-01	.15039-01	.29750-01	
1.00	.20	.13090 00	.40243 00	.40243 00	.42857 00	.31059-01	.31059-01	.59500-01	
1.00	1.00	.65450 00	.40243 00	.40243 00	.42857 00	.31237 00	.31237 00	.29750 00	
1.00	2.00	.13090 01	.40243 00	.40243 00	.42857 00	.16065 01	.16065 01	.59500 00	
.10	.10	.65293-02	.40586 00	.41155 00	.41155 00	.30593-04	.15221-02	.15221-02	$\alpha=2.00$ $\beta=3.00$ $\gamma=3.00$
.25	.20	.32646-01	.40586 00	.41155 00	.41155 00	.78395-03	.78397-02	.80118-02	
.50	.25	.81616-01	.40586 00	.41155 00	.41155 00	.59752-02	.20029-01	.23615-01	
.50	.50	.16323 00	.40586 00	.41155 00	.41155 00	.19121-01	.47229-01	.47229-01	
1.00	.10	.65293-01	.40586 00	.41155 00	.41155 00	.15449-01	.15221-01	.30354-01	
1.00	.20	.13059 00	.40586 00	.41155 00	.41155 00	.31817-01	.31359-01	.50728-01	
1.00	1.00	.65293 00	.40586 00	.41155 00	.41155 00	.30593 00	.30364 00	.30354 00	
1.00	2.00	.13059 01	.40586 00	.41155 00	.41155 00	.15297 01	.15251 01	.50728 00	

TABLE III GEOMETRICAL AND INERTIAL CHARACTERISTICS OF GENERAL SOLIDS

$\frac{b}{a}$	$\frac{c}{a}$	$\frac{V_{vg}}{a^3}$	$\frac{\bar{x}_{vg}}{a}$	$\frac{\bar{y}_{vg}}{b}$	$\frac{\bar{z}_{vg}}{c}$	$\frac{I_{xvg}}{\rho a^5}$	$\frac{I_{yvg}}{\rho a^5}$	$\frac{I_{zvg}}{\rho a^5}$	
.10	.10	.71620-02	.42050 00	.42181 00	.43677 00	.36121-04	.17797-02	.17797-02	$a = 2.00$ $\beta = 3.00$ $\gamma = 5.00$
.25	.20	.35810-01	.42050 00	.42181 00	.43677 00	.91995-03	.91770-02	.93545-02	
.50	.25	.89525-01	.42050 00	.42181 00	.43677 00	.69374-02	.23464-01	.27502-01	
.50	.50	.17905 00	.42050 00	.42181 00	.43677 00	.22575-01	.55630-01	.55003-01	
1.00	.10	.71620-01	.42050 00	.42181 00	.43677 00	.17745-01	.17797-01	.35171-01	
1.00	.20	.14324 00	.42050 00	.42181 00	.43677 00	.36503-01	.35708-01	.70341-01	
1.00	1.00	.71520 00	.42050 00	.42181 00	.43677 00	.36121 00	.36173 00	.35171 00	
1.00	2.00	.14324 01	.42050 00	.42181 00	.43677 00	.18361 01	.18371 01	.70341 00	
.10	.10	.77682-02	.43683 00	.44405 00	.44405 00	.41545-04	.20650-02	.20550-02	$a = 2.00$ $\beta = 5.00$ $\gamma = 5.00$
.25	.20	.38841-01	.43683 00	.44405 00	.44405 00	.10645-02	.10637-01	.10370-01	
.50	.25	.97103-01	.43683 00	.44405 00	.44405 00	.81142-02	.27175-01	.32045-01	
.50	.50	.19421 00	.43683 00	.44405 00	.44405 00	.25965-01	.64089-01	.64089-01	
1.00	.10	.77682-01	.43683 00	.44405 00	.44405 00	.20980-01	.20650-01	.41215-01	
1.00	.20	.15536 00	.43683 00	.44405 00	.44405 00	.43205-01	.42547-01	.82430-01	
1.00	1.00	.77682 00	.43683 00	.44405 00	.44405 00	.41545 00	.41215 00	.41215 00	
1.00	2.00	.15536 01	.43683 00	.44405 00	.44405 00	.20772 01	.20705 01	.82430 00	
.10	.10	.71207-02	.42453 00	.42453 00	.42453 00	.35333-04	.17843-02	.17843-02	$a = 3.00$ $\beta = 3.00$ $\gamma = 3.00$
.25	.20	.35604-01	.42453 00	.42453 00	.42453 00	.90540-03	.91865-02	.93853-02	
.50	.25	.89009-01	.42453 00	.42453 00	.42453 00	.69009-02	.23463-01	.27604-01	
.50	.50	.17802 00	.42453 00	.42453 00	.42453 00	.22083-01	.55207-01	.55207-01	
1.00	.10	.71207-01	.42453 00	.42453 00	.42453 00	.17843-01	.17843-01	.35333-01	
1.00	.20	.14241 00	.42453 00	.42453 00	.42453 00	.36746-01	.36745-01	.70565-01	
1.00	1.00	.71207 00	.42453 00	.42453 00	.42453 00	.35333 00	.35333 00	.35333 00	
1.00	2.00	.14241 01	.42453 00	.42453 00	.42453 00	.17666 01	.17566 01	.70566 00	
.10	.10	.77006-02	.43618 00	.43618 00	.44599 00	.40839-04	.20285-02	.20278-02	$a = 3.00$ $\beta = 3.00$ $\gamma = 5.00$
.25	.20	.38503-01	.43618 00	.43618 00	.44599 00	.10426-02	.10454-01	.10565-01	
.50	.25	.96258-01	.43618 00	.43618 00	.44599 00	.78962-02	.25713-01	.31371-01	
.50	.50	.19252 00	.43618 00	.43618 00	.44599 00	.25524-01	.63170-01	.62742-01	
1.00	.10	.77006-01	.43618 00	.43618 00	.44599 00	.20285-01	.20285-01	.40155-01	
1.00	.20	.15401 00	.43618 00	.43618 00	.44599 00	.41815-01	.41815-01	.80310-01	
1.00	1.00	.77006 00	.43618 00	.43618 00	.44599 00	.40839 00	.40839 00	.40155 00	
1.00	2.00	.15401 01	.43618 00	.43618 00	.44599 00	.20625 01	.20525 01	.80310 00	
.10	.10	.82241-02	.44920 00	.45427 00	.45427 00	.45905-04	.22852-02	.22852-02	$a = 3.00$ $\beta = 5.00$ $\gamma = 5.00$
.25	.20	.41120-01	.44920 00	.45427 00	.45427 00	.11763-02	.11770-01	.12029-01	
.50	.25	.10280 00	.44920 00	.45427 00	.45427 00	.89660-02	.30071-01	.35451-01	
.50	.50	.20560 00	.44920 00	.45427 00	.45427 00	.28691-01	.70902-01	.70902-01	
1.00	.10	.82241-01	.44920 00	.45427 00	.45427 00	.23183-01	.22852-01	.45576-01	
1.00	.20	.16448 00	.44920 00	.45427 00	.45427 00	.47742-01	.47081-01	.91151-01	
1.00	1.00	.82241 00	.44920 00	.45427 00	.45427 00	.45905 00	.45575 00	.45575 00	
1.00	2.00	.16448 01	.44920 00	.45427 00	.45427 00	.22953 01	.22887 01	.91151 00	
.10	.10	.86629-02	.46353 00	.46353 00	.46353 00	.50218-04	.25360-02	.25350-02	$a = 5.00$ $\beta = 5.00$ $\gamma = 5.00$
.25	.20	.43315-01	.46353 00	.46353 00	.46353 00	.12868-02	.13057-01	.13339-01	
.50	.25	.10829 00	.46353 00	.46353 00	.46353 00	.98081-02	.33348-01	.39232-01	
.50	.50	.21557 00	.46353 00	.46353 00	.46353 00	.31386-01	.78465-01	.79455-01	
1.00	.10	.86629-01	.46353 00	.46353 00	.46353 00	.25360-01	.25360-01	.50218 00	
1.00	.20	.17326 00	.46353 00	.46353 00	.46353 00	.52225-01	.52226-01	.10044 00	
1.00	1.00	.86629 00	.46353 00	.46353 00	.46353 00	.50218 00	.50218 00	.50218 00	
1.00	2.00	.17326 01	.46353 00	.46353 00	.46353 00	.25109 01	.25109 01	.10044 01	
.10	.10	.90498-02	.47125 00	.47125 00	.47862 00	.54806-04	.27328-02	.27321-02	$a = 5.00$ $\beta = 5.00$ $\gamma = 10.0$
.25	.20	.45249-01	.47125 00	.47125 00	.47862 00	.14004-02	.14080-01	.14371-01	
.50	.25	.11312 00	.47125 00	.47125 00	.47862 00	.10622-01	.35981-01	.42266-01	
.50	.50	.22625 00	.47125 00	.47125 00	.47862 00	.34254-01	.84973-01	.84533-01	
1.00	.10	.90498-01	.47125 00	.47125 00	.47862 00	.27328-01	.27328-01	.54101-01	
1.00	.20	.18100 00	.47125 00	.47125 00	.47862 00	.56321-01	.55321-01	.10820 00	
1.00	1.00	.90498 00	.47125 00	.47125 00	.47862 00	.54806 00	.54806 00	.54101 00	
1.00	2.00	.18100 01	.47125 00	.47125 00	.47862 00	.27615 01	.27615 01	.10920 01	
.10	.10	.95940-02	.48811 00	.48811 00	.48811 00	.61103-04	.30857-02	.30857-02	$a = 10.0$ $\beta = 10.0$ $\gamma = 10.0$
.25	.20	.47970-01	.48811 00	.48811 00	.48811 00	.15558-02	.15887-01	.15231-01	
.50	.25	.11993 00	.48811 00	.48811 00	.48811 00	.11934-01	.40576-01	.47737-01	
.50	.50	.23985 00	.48811 00	.48811 00	.48811 00	.38190-01	.95474-01	.95474-01	
1.00	.10	.95940-01	.48811 00	.48811 00	.48811 00	.30857-01	.30857-01	.61103-01	
1.00	.20	.19188 00	.48811 00	.48811 00	.48811 00	.63549-01	.63548-01	.12221 00	
1.00	1.00	.95940 00	.48811 00	.48811 00	.48811 00	.61103 00	.61103 00	.61103 00	
1.00	2.00	.19188 01	.48811 00	.48811 00	.48811 00	.30552 01	.30552 01	.12221 01	

TABLE IV GEOMETRICAL AND INERTIAL CHARACTERISTICS OF SOLIDS OF REVOLUTION

α	β	$\frac{A_a}{ab}$	$\frac{\bar{x}_a}{a}$	$\frac{\bar{y}_a}{b}$	$\frac{I_{x_a}}{ab^3}$	$\frac{I_{y_a}}{a^3b}$	$\frac{V_{x_a}}{ab^2}$	$\frac{V_{y_a}}{a^2b}$	$\frac{\bar{x}_v}{a}$	$\frac{I_{x_m}}{\rho ab^4}$	$\frac{I_{y_m} - \frac{1}{2}I_{x_m}}{\rho a^3b^2}$
.20	.20	.39683-02	.04196	.04196	.21500-04	.21500-04	.10462-02	.10462-02	.00813	.29565-04	.32037-06
.20	.50	.47619-01	.15909	.08333	.72150-03	.24510-02	.24933-01	.47600-01	.06294	.12205-02	.27017-03
.20	.75	.10541 00	.22636	.11486	.26455-02	.97104-02	.76069-01	.14992 00	.11449	.50498-02	.22629-02
.20	1.00	.16667 00	.27273	.14286	.59524-02	.20833-01	.14960 00	.28560 00	.15909	.12467-01	.77000-02
.20	1.20	.21375 00	.30018	.16284	.94720-02	.31243-01	.21870 00	.40315 00	.18917	.21073-01	.14992-01
.20	1.40	.25774 00	.32185	.18090	.13614-01	.42196-01	.29296 00	.52122 00	.21490	.31883-01	.24779-01
.20	1.60	.29830 00	.33934	.19724	.18235-01	.53218-01	.36969 00	.63602 00	.23700	.44636-01	.36723-01
.20	1.80	.33545 00	.35375	.21208	.23205-01	.64019-01	.44700 00	.74560 00	.25610	.59038-01	.50414-01
.20	2.00	.36941 00	.36580	.22559	.28416-01	.74431-01	.52360 00	.84905 00	.27273	.74800-01	.65450-01
.20	2.50	.44210 00	.38878	.25454	.41961-01	.98299-01	.70705 00	.10799 01	.30607	.11845 00	.10666 00
.20	3.00	.50069 00	.40506	.27807	.55556-01	.11895 00	.87480 00	.12743 01	.33104	.16557 00	.14992 00
.20	4.00	.58838 00	.42659	.31392	.81151-01	.15196 00	.11605 01	.15771 01	.36580	.26180 00	.23383 00
.20	5.00	.65039 00	.44018	.33987	.10369 00	.17667 00	.13889 01	.17988 01	.38878	.35352 00	.30881 00
.20	7.00	.73176 00	.45634	.37485	.13988 00	.21064 00	.17235 01	.20982 01	.41720	.51283 00	.42943 00
.20	10.00	.80141 00	.46894	.40578	.17788 00	.24101 00	.20433 01	.23613 01	.44018	.69444 00	.55502 00
.50	.20	.47619-01	.08333	.15909	.24510-02	.72150-03	.47600-01	.24933-01	.03297	.68000-02	.13077-03
.50	.50	.16667 00	.20000	.20000	.11905-01	.11905-01	.20944 00	.20944 00	.10714	.34907-01	.49867-02
.50	.75	.25714 00	.25962	.22727	.22222-01	.28748-01	.36720 00	.41945 00	.15882	.67642-01	.17554-01
.50	1.00	.33333 00	.30000	.25000	.33333-01	.47619-01	.52360 00	.62832 00	.20000	.10472 00	.37400-01
.50	1.20	.38503 00	.32384	.26563	.42328-01	.62560-01	.64260 00	.78343 00	.22689	.13593 00	.57052-01
.50	1.40	.42982 00	.34266	.27941	.51202-01	.76775-01	.75460 00	.92540 00	.24958	.16769 00	.78873-01
.50	1.60	.46886 00	.35788	.29167	.59841-01	.90053-01	.85924 00	.10543 01	.26891	.19947 00	.10198 00
.50	1.80	.50311 00	.37043	.30263	.68182-01	.10234 00	.95665 00	.11710 01	.28555	.23092 00	.12572 00
.50	2.00	.53333 00	.38095	.31250	.76190-01	.11366 00	.10472 01	.12766 01	.30000	.26180 00	.14960 00
.50	2.50	.59524 00	.40107	.33333	.94697-01	.13816 00	.12467 01	.15000 01	.32895	.33564 00	.20795 00
.50	3.00	.64286 00	.41538	.35000	.11111 00	.15811 00	.14137 01	.16778 01	.35065	.40392 00	.26244 00
.50	4.00	.71111 00	.43435	.37500	.13853 00	.18828 00	.16755 01	.19409 01	.38095	.52360 00	.35709 00
.50	5.00	.75758 00	.44643	.39286	.16026 00	.20980 00	.18700 01	.21250 01	.40107	.62333 00	.43403 00
.50	7.00	.81667 00	.46082	.41667	.19216 00	.23825 00	.21380 01	.23646 01	.42609	.77746 00	.54838 00
.50	10.00	.86580 00	.47207	.43750	.22229 00	.26276 00	.23800 01	.25681 01	.44643	.93500 00	.65912 00
.75	.20	.10541 00	.11486	.22636	.97104-02	.26455-02	.14992 00	.76069-01	.05810	.31945-01	.10462-02
.75	.50	.25714 00	.22727	.25962	.28748-01	.22222-01	.41945 00	.36720 00	.13904	.97538-01	.14960-01
.75	.75	.35333 00	.28167	.28167	.44505-01	.44505-01	.62532 00	.62532 00	.18894	.15433 00	.38880-01
.75	1.00	.42857 00	.31818	.30000	.59341-01	.66667-01	.80784 00	.85680 00	.22727	.20973 00	.69813-01
.75	1.20	.47759 00	.33969	.31258	.70419-01	.83124-01	.93798 00	.10193 01	.25192	.25228 00	.97200-01
.75	1.40	.51903 00	.35667	.32366	.80788-01	.98188-01	.10555 01	.11632 01	.27257	.29300 00	.12555 00
.75	1.60	.55448 00	.37041	.33350	.90475-01	.11186 00	.11619 01	.12905 01	.29009	.33184 00	.15404 00
.75	1.80	.58512 00	.38176	.34230	.99523-01	.12424 00	.12585 01	.14035 01	.30513	.36880 00	.18211 00
.75	2.00	.61186 00	.39128	.35022	.10798 00	.13545 00	.13464 01	.15042 01	.31818	.40392 00	.20944 00
.75	2.50	.66581 00	.40951	.36691	.12681 00	.15915 00	.15350 01	.17131 01	.34430	.48424 00	.27339 00
.75	3.00	.70666 00	.42251	.38026	.14286 00	.17802 00	.16884 01	.18760 01	.36389	.55501 00	.33048 00
.75	4.00	.76434 00	.43981	.40025	.16865 00	.20593 00	.19222 01	.21122 01	.39128	.67320 00	.42553 00
.75	5.00	.80310 00	.45080	.41453	.18839 00	.22547 00	.20917 01	.22747 01	.40951	.76748 00	.50000 00
.75	7.00	.85186 00	.46396	.43354	.21652 00	.25089 00	.23205 01	.24833 01	.43224	.90770 00	.60732 00
.75	10.00	.89200 00	.47428	.45017	.24293 00	.27248 00	.25230 01	.26582 01	.45080	.10459 01	.70833 00
1.00	.20	.16667 00	.14286	.27273	.20833-01	.59524-02	.28560 00	.14960 00	.08333	.74800-01	.36615-02
1.00	.50	.33333 00	.25000	.30000	.47619-01	.33333-01	.62832 00	.52360 00	.16667	.17453 00	.29920-01
1.00	.75	.42857 00	.30000	.31818	.66667-01	.59341-01	.85680 00	.80784 00	.21429	.24802 00	.64800-01
1.00	1.00	.50000 00	.33333	.33333	.83333-01	.83333-01	.10472 01	.10472 01	.25000	.31416 00	.10472 00
1.00	1.20	.54545 00	.35294	.34375	.95238-01	.10044 00	.11781 01	.12096 01	.27273	.36249 00	.13770 00
1.00	1.40	.58333 00	.36842	.35294	.10606 00	.11572 00	.12936 01	.13503 01	.29167	.40724 00	.17039 00
1.00	1.60	.61538 00	.38095	.36111	.11594 00	.12934 00	.13963 01	.14730 01	.30769	.44880 00	.20217 00
1.00	1.80	.64286 00	.39130	.36842	.12500 00	.14150 00	.14881 01	.15806 01	.32143	.48749 00	.23270 00
1.00	2.00	.66667 00	.40000	.37500	.13333 00	.15238 00	.15708 01	.16755 01	.33333	.52360 00	.26180 00
1.00	2.50	.71429 00	.41667	.38889	.15152 00	.17507 00	.17453 01	.18700 01	.35714	.60415 00	.32807 00
1.00	3.00	.75000 00	.42857	.40000	.16667 00	.19286 00	.18850 01	.20196 01	.37500	.67320 00	.38556 00
1.00	4.00	.80000 00	.44444	.41667	.19048 00	.21880 00	.20944 01	.22340 01	.40000	.78540 00	.47872 00
1.00	5.00	.83333 00	.45455	.42857	.20833 00	.23674 00	.22440 01	.23800 01	.41667	.87266 00	.55000 00
1.00	7.00	.87500 00	.46667	.44444	.23333 00	.25985 00	.24435 01	.25656 01	.43750	.99960 00	.65070 00
1.00	10.00	.90909 00	.47619	.45833	.25641 00	.27929 00	.26180 01	.27200 01	.45455	.11220 01	.74375 00
1.20	.20	.21375 00	.16284	.30018	.31243-01	.94720-02	.40315 00	.21870 00	.10262	.11725 00	.73830-02
1.20	.50	.38503 00	.26533	.32384	.62560-01	.42328-01	.78343 00	.64260 00	.18610	.23859 00	.44636-01
1.20	.75	.47759 00	.31258	.33969	.83124-01	.70419-01	.10193 01	.93798 00	.23181	.32077 00	.87344-01
1.20	1.00	.54545 00	.34375	.35294	.10044 00	.95238-01	.12096 01	.11781 01	.26563	.39171 00	.13298 00
1.20	1.20	.58810 00	.36207	.36207	.11253 00	.11253 00	.13379 01	.13379 01	.28701	.44222 00	.16923 00
1.20	1.40	.62335 00	.37653	.37013	.12334 00	.12775 00	.14497 01	.14747 01	.30477	.48818 00	.20429 00
1.20	1.60	.65301 00	.38824	.37731	.13310 00	.14117 00	.15481 01	.15929 01	.31978	.53026 00	.23773 00
1.20	1.80	.67831 00	.39792	.38374	.14195 00	.15306 00	.16355 01	.16959 01	.33262	.56900 00	.26938 00
1.20	2.00	.70016 00	.40605	.38952	.15003 00	.16362 00	.17135 01	.17863 01	.34375	.60480 00	.29920 00
1.20	2.50	.74364 00	.42165	.40175	.16747 00	.18548 00	.18772 01	.19701 01	.36599	.68362 00	.36604 00
1.20	3.00	.77608 00	.43280	.41155	.18182 00	.20245 00	.20968 01	.21105 01	.38268	.75020 00	.42307 00
1.20	4.00	.82125 00	.44769	.42626	.20410 00	.22702 00	.21996 01	.23102 01	.40605	.85680 00	.51404 00
1.20	5.00	.85129 00	.45717	.43677	.22063 00	.24388 00	.23362 01	.24453 01	.42165	.93858 00	.58269 00
1.20	7.00	.88866 00	.46857	.45080	.24354 00	.26547 00	.25171 01	.26163 01	.44117	.10561 01	.67855 00
1.20	10.00	.91914 00	.47754	.46309	.26450 00	.28353 00	.26744 01	.27578 01	.45717	.11681 01	.76617 00

TABLE IV GEOMETRICAL AND INERTIAL CHARACTERISTICS OF SOLIDS OF REVOLUTION

a	β	$\frac{A_a}{ab}$	$\frac{\bar{x}_a}{a}$	$\frac{\bar{y}_a}{b}$	$\frac{I_{xa}}{ab^3}$	$\frac{I_{ya}}{a^3b}$	$\frac{V_{xa}}{ab^2}$	$\frac{V_{ya}}{a^2b}$	$\frac{\bar{x}_v}{a}$	$\frac{I_{xm}}{\rho ab^4}$	$\frac{I_{ym} \frac{1}{2} I_{xm}}{\rho a^3 b^2}$							
1.40	.20	.25774	.00	.18C9C	.32185	.42196-01	.13614-01	.52122	.00	.12079	.16349	.00	.12659-01					
1.40	.50	.42982	.00	.27941	.34266	.76775-01	.51202-01	.92540	.00	.75460	.00	.20351	.30138	.00	.61100-01			
1.40	.75	.51903	.00	.32366	.35667	.98188-01	.80788-01	.11632	.01	.10555	.01	.24734	.38919	.00	.11064	.00		
1.40	1.00	.58333	.00	.35294	.36842	.11572	.00	.10606	.00	.13503	.01	.12936	.01	.27941	.46270	.00	.16085	.00
1.40	1.20	.62335	.00	.37C13	.37653	.12775	.00	.12334	.00	.14747	.01	.14497	.01	.29959	.51405	.00	.19955	.00
1.40	1.40	.65625	.00	.38370	.38370	.13839	.00	.13839	.00	.15821	.01	.15821	.01	.31632	.56019	.00	.23627	.00
1.40	1.60	.68379	.00	.39469	.39009	.14790	.00	.15155	.00	.16760	.01	.16958	.01	.33043	.60199	.00	.27078	.00
1.40	1.80	.70721	.00	.40378	.39582	.15647	.00	.16313	.00	.17589	.01	.17942	.01	.34250	.64015	.00	.30307	.00
1.40	2.00	.72738	.00	.41142	.40098	.16425	.00	.17337	.00	.18326	.01	.18803	.01	.35294	.67517	.00	.33320	.00
1.40	2.50	.76736	.00	.42608	.41190	.18088	.00	.19440	.00	.19860	.01	.20543	.01	.37382	.75151	.00	.39992	.00
1.40	3.00	.79708	.00	.43657	.42066	.19444	.00	.21063	.00	.21068	.01	.21864	.01	.38947	.81529	.00	.45612	.00
1.40	4.00	.83834	.00	.45058	.43382	.21532	.00	.23395	.00	.22851	.01	.23734	.01	.41142	.91630	.00	.54465	.00
1.40	5.00	.86563	.00	.45952	.44324	.23067	.00	.24987	.00	.24107	.01	.24993	.01	.42608	.99300	.00	.61072	.00
1.40	7.00	.89954	.00	.47C28	.45582	.25180	.00	.27015	.00	.25763	.01	.26580	.01	.44445	.11022	.01	.70214	.00
1.40	10.00	.92711	.00	.47875	.46684	.27100	.00	.28705	.00	.27195	.01	.27888	.01	.45952	.12054	.01	.78498	.00
1.60	.20	.2983C	.00	.19724	.33934	.53218-01	.18235-01	.63602	.00	.36969	.00	.13775	.00	.21122	.00	.00	.19436-01	
1.60	.50	.46886	.00	.29167	.35788	.90053-01	.59841-01	.10543	.01	.85924	.00	.21916	.00	.36135	.00	.00	.78768-01	
1.60	.75	.55448	.00	.33350	.37041	.11186	.00	.90475-01	.12905	.01	.11619	.01	.26118	.00	.00	.13416	.00	
1.60	1.00	.61538	.00	.36111	.38095	.12934	.00	.11594	.00	.14730	.01	.13963	.01	.29167	.00	.00	.18800	.00
1.60	1.20	.65301	.00	.37731	.38824	.14117	.00	.13310	.00	.15929	.01	.15481	.01	.31077	.00	.00	.22849	.00
1.60	1.40	.68379	.00	.39C09	.39469	.15155	.00	.14790	.00	.16958	.01	.16760	.01	.32658	.00	.00	.26633	.00
1.60	1.60	.70948	.00	.40C45	.40045	.16076	.00	.16076	.00	.17851	.01	.17851	.01	.33989	.00	.00	.30148	.00
1.60	1.80	.73126	.00	.40901	.40561	.16902	.00	.17201	.00	.18637	.01	.18793	.01	.35127	.00	.00	.33407	.00
1.60	2.00	.74997	.00	.41621	.41027	.17646	.00	.18193	.00	.19333	.01	.19613	.01	.36111	.00	.00	.36424	.00
1.60	2.50	.78698	.00	.43004	.42013	.19230	.00	.20217	.00	.20774	.01	.21264	.01	.38078	.00	.00	.43041	.00
1.60	3.00	.81439	.00	.43994	.42804	.20513	.00	.21771	.00	.21903	.01	.22512	.01	.39553	.00	.00	.48554	.00
1.60	4.00	.85234	.00	.45318	.43995	.22472	.00	.23991	.00	.23561	.01	.24270	.01	.41621	.00	.00	.57154	.00
1.60	5.00	.87738	.00	.46164	.44848	.23904	.00	.25500	.00	.24724	.01	.25449	.01	.43004	.00	.00	.63515	.00
1.60	7.00	.90841	.00	.47181	.45988	.25864	.00	.27414	.00	.26249	.01	.26930	.01	.44738	.00	.00	.72250	.00
1.60	10.00	.93361	.00	.47984	.46989	.27635	.00	.29004	.00	.27564	.01	.28147	.01	.46164	.00	.00	.80109	.00
1.80	.20	.33545	.00	.21208	.35375	.64019-01	.23205-01	.74560	.00	.44700	.00	.15354	.00	.25891	.00	.00	.27580-01	
1.80	.50	.50311	.00	.30263	.37043	.10234	.00	.68182-01	.11710	.01	.95665	.00	.23329	.00	.00	.97200-01		
1.80	.75	.58122	.00	.3423C	.38176	.12424	.00	.99523-01	.14035	.01	.12585	.01	.27360	.00	.00	.15753	.00	
1.80	1.00	.64286	.00	.36842	.39130	.14150	.00	.12500	.00	.15806	.01	.14881	.01	.30263	.00	.00	.21420	.00
1.80	1.20	.67831	.00	.38374	.39792	.15306	.00	.14195	.00	.16959	.01	.16355	.01	.32077	.00	.00	.25599	.00
1.80	1.40	.70721	.00	.39582	.40378	.16313	.00	.15647	.00	.17942	.01	.17589	.01	.33575	.00	.00	.29455	.00
1.80	1.60	.73126	.00	.40561	.40901	.17201	.00	.16902	.00	.18793	.01	.18637	.01	.34835	.00	.00	.33003	.00
1.80	1.80	.75161	.00	.41371	.41371	.17994	.00	.17994	.00	.19538	.01	.19538	.01	.35911	.00	.00	.36266	.00
1.80	2.00	.76906	.00	.42052	.41795	.18707	.00	.18953	.00	.20196	.01	.20320	.01	.36842	.00	.00	.39270	.00
1.80	2.50	.80348	.00	.43361	.42694	.20214	.00	.20904	.00	.21554	.01	.21890	.01	.38702	.00	.00	.45802	.00
1.80	3.00	.82892	.00	.44298	.43416	.21429	.00	.22393	.00	.22612	.01	.23072	.01	.40096	.00	.00	.51198	.00
1.80	4.00	.86406	.00	.45553	.44503	.23273	.00	.24512	.00	.24161	.01	.24731	.01	.42052	.00	.00	.59543	.00
1.80	5.00	.88719	.00	.46355	.45282	.24614	.00	.25946	.00	.25242	.01	.25840	.01	.43361	.00	.00	.65671	.00
1.80	7.00	.91582	.00	.47320	.46325	.26441	.00	.27760	.00	.26657	.01	.27229	.01	.45003	.00	.00	.74032	.00
1.80	10.00	.93901	.00	.48082	.47241	.28083	.00	.29261	.00	.27872	.01	.28369	.01	.46355	.00	.00	.81511	.00
2.00	.20	.36941	.00	.22559	.36580	.74431-01	.28416-01	.84905	.00	.52360	.00	.16819	.00	.30559	.00	.00	.36915-01	
2.00	.50	.53333	.00	.31250	.38095	.11366	.00	.76190-01	.12766	.01	.10472	.01	.24609	.00	.00	.11605	.00	
2.00	.75	.61186	.00	.35022	.39128	.13545	.00	.10798	.00	.15042	.01	.13464	.01	.28479	.00	.00	.18051	.00
2.00	1.00	.66667	.00	.37500	.40000	.15238	.00	.13333	.00	.16755	.01	.15708	.01	.31250	.00	.00	.23936	.00
2.00	1.20	.70016	.00	.38952	.40605	.16362	.00	.15003	.00	.17863	.01	.17136	.01	.32976	.00	.00	.28205	.00
2.00	1.40	.72738	.00	.40098	.41142	.17337	.00	.16425	.00	.18803	.01	.18326	.01	.34399	.00	.00	.32102	.00
2.00	1.60	.74997	.00	.41027	.41621	.18193	.00	.17646	.00	.19613	.01	.19333	.01	.35595	.00	.00	.35660	.00
2.00	1.80	.76906	.00	.41795	.42052	.18953	.00	.18707	.00	.20320	.01	.20196	.01	.36617	.00	.00	.38911	.00
2.00	2.00	.7854C	.00	.42441	.42441	.19635	.00	.19635	.00	.20944	.01	.20944	.01	.37500	.00	.00	.41888	.00
2.00	2.50	.81758	.00	.43266	.43266	.21071	.00	.21515	.00	.22226	.01	.22440	.01	.39263	.00	.00	.48317	.00
2.00	3.00	.84131	.00	.44573	.43930	.22222	.00	.22945	.00	.23222	.01	.23562	.01	.40586	.00	.00	.53589	.00
2.00	4.00	.87402	.00	.45766	.44930	.23963	.00	.24972	.00	.24674	.01	.25133	.01	.42441	.00	.00	.61685	.00
2.00	5.00	.89552	.00	.46528	.45648	.25223	.00	.26339	.00	.25585	.01	.26180	.01	.43683	.00	.00	.67592	.00
2.00	7.00	.92209	.00	.47447	.46609	.26933	.00	.28064	.00	.27004	.01	.27489	.01	.45243	.00	.00	.75610	.00
2.00	10.00	.94359	.00	.48172	.47453	.28465	.00	.29487	.00	.28134	.01	.28560	.01	.46528	.00	.00	.82746	.00
2.50	.20	.44210	.00	.25454	.38878	.98299-01	.41961-01	.10799	.01	.70705	.00	.20039	.00	.41473	.00	.00	.64243-01	
2.50	.50	.59524	.00	.33333	.40107	.13816	.00	.94697-01	.15000	.01	.12467	.01	.27339	.00	.00	.16346	.00	
2.50	.75	.66581	.00	.36691	.40951	.15915	.00	.12681	.00	.17131	.01	.15350	.01	.30849	.00	.00	.23532	.00
2.50	1.00	.71429	.00	.38889	.41667	.17507	.00	.15152	.00	.18700	.01	.17453	.01	.33333	.00	.00	.29750	.00
2.50	1.20	.74364	.00	.40175	.42165	.18548	.00	.16747	.00	.19701	.01	.18772	.01	.34873	.00	.00	.34121	.00
2.50	1.40	.76736	.00	.41190	.42608	.19440	.00	.18088	.00	.20543	.01	.19860	.01	.36138	.00	.00	.38033	.00
2.50	1.60	.78698	.00	.42013	.43004	.20217	.00	.19230	.00	.21264	.01	.20774	.01	.37200	.00	.00	.41549	.00
2.50	1.80	.80348	.00	.42694	.43361	.20904	.00	.20214	.00	.21890	.01	.21554	.01	.38106	.00	.00	.44723	.00
2.50	2.00	.81758	.00	.43266	.43683	.21515	.00	.21071	.00	.22440	.01	.22226	.01	.38889	.00	.00	.47600	.00
2.50	2.50	.84523	.00	.44368	.44368	.22794	.00	.22794	.00	.23563	.01	.23563	.01	.40451	.00	.00	.53732	.00
2.50	3.00	.86555	.00	.45159	.44920	.23810	.00	.24093	.00	.24429	.01	.24559	.01	.41622	.00	.00	.58688	.00
2.50	4.00	.89346	.00	.46219	.45753	.25332	.00	.										

TABLE IV GEOMETRICAL AND INERTIAL CHARACTERISTICS OF SOLIDS OF REVOLUTION

a	β	$\frac{A_a}{ab}$	$\frac{\bar{x}_a}{a}$	$\frac{\bar{y}_a}{b}$	$\frac{I_{x_a}}{ab^3}$	$\frac{I_{y_a}}{a^3b}$	$\frac{V_{x_a}}{ab^2}$	$\frac{V_{y_a}}{a^2b}$	$\frac{\bar{x}_v}{a}$	$\frac{I_{x_m}}{\rho ab^4}$	$\frac{I_{y_m} - \frac{1}{2}I_{x_m}}{\rho a^3b^2}$
3.00	.20	.50069 00	.27807	.40506	.11895 00	.55556-01	.12743 01	.87480 00	.22726	.51112 00	.95200-01
3.00	.50	.64286 00	.35000	.41538	.15811 00	.11111 00	.16778 01	.14137 01	.29545	.68277 00	.20944 00
3.00	.75	.70666 00	.38026	.42251	.17802 00	.14286 00	.18760 01	.16884 01	.32750	.77167 00	.28560 00
3.00	1.00	.75000 00	.40000	.42857	.19286 00	.16667 00	.20196 01	.18850 01	.35000	.83891 00	.34907 00
3.00	1.20	.77608 00	.41155	.43280	.20245 00	.18182 00	.21105 01	.20068 01	.36389	.88296 00	.39270 00
3.00	1.40	.79708 00	.42066	.43657	.21063 00	.19444 00	.21864 01	.21068 01	.37528	.92087 00	.43120 00
3.00	1.60	.81439 00	.42804	.43994	.21771 00	.20513 00	.22512 01	.21903 01	.38483	.95404 00	.46542 00
3.00	1.80	.82892 00	.43416	.44298	.22393 00	.21429 00	.23072 01	.22612 01	.39297	.98345 00	.49604 00
3.00	2.00	.84131 00	.43930	.44573	.22945 00	.22222 00	.23562 01	.23222 01	.40000	.10098 01	.52360 00
3.00	2.50	.86555 00	.44920	.45159	.24093 00	.23810 00	.24559 01	.24429 01	.41402	.10653 01	.58178 00
3.00	3.00	.88332 00	.45631	.45631	.25000 00	.25000 00	.25325 01	.25325 01	.42453	.11100 01	.62832 00
3.00	4.00	.90766 00	.46585	.46345	.26352 00	.26667 00	.26431 01	.26567 01	.43930	.11781 01	.69813 00
3.00	5.00	.92356 00	.47197	.46859	.27317 00	.27778 00	.27192 01	.27388 01	.44920	.12280 01	.74800 00
3.00	7.00	.94313 00	.47935	.47550	.28612 00	.29167 00	.28177 01	.28406 01	.46167	.12967 01	.81449 00
3.00	10.00	.95890 00	.48520	.48158	.29758 00	.30303 00	.29015 01	.29233 01	.47197	.13596 01	.87266 00
4.00	.20	.58838 00	.31392	.42659	.15196 00	.81151-01	.15771 01	.11605 01	.26918	.66809 00	.16069 00
4.00	.50	.71111 00	.37500	.43439	.18828 00	.13853 00	.19409 01	.16755 01	.32887	.83070 00	.29319 00
4.00	.75	.76434 00	.40025	.43981	.20593 00	.16865 00	.21122 01	.19222 01	.35609	.91105 00	.37239 00
4.00	1.00	.80000 00	.41667	.44444	.21880 00	.19048 00	.22340 01	.20944 01	.37500	.97043 00	.43520 00
4.00	1.20	.82129 00	.42626	.44769	.22702 00	.20410 00	.23102 01	.21996 01	.38661	.10088 01	.47713 00
4.00	1.40	.83834 00	.43382	.45058	.23395 00	.21532 00	.23734 01	.22851 01	.39611	.10414 01	.51343 00
4.00	1.60	.85234 00	.43995	.45318	.23991 00	.22472 00	.24270 01	.23561 01	.40406	.10698 01	.54522 00
4.00	1.80	.86406 00	.44503	.45553	.24512 00	.23273 00	.24731 01	.24161 01	.41083	.10948 01	.57334 00
4.00	2.00	.87402 00	.44930	.45766	.24972 00	.23963 00	.25133 01	.24674 01	.41667	.11170 01	.59840 00
4.00	2.50	.89346 00	.45753	.46219	.25922 00	.25332 00	.25946 01	.25685 01	.42831	.11635 01	.65063 00
4.00	3.00	.90766 00	.46345	.46585	.26667 00	.26352 00	.26567 01	.26431 01	.43704	.12006 01	.69183 00
4.00	4.00	.92356 00	.47140	.47140	.27768 00	.27768 00	.27458 01	.27458 01	.44930	.12566 01	.75281 00
4.00	5.00	.93967 00	.47651	.47541	.28549 00	.28706 00	.28069 01	.28134 01	.45753	.12973 01	.79584 00
4.00	7.00	.95517 00	.48268	.48080	.29590 00	.29872 00	.28855 01	.28968 01	.46792	.13529 01	.85263 00
4.00	10.00	.96763 00	.48758	.48555	.30506 00	.30821 00	.29521 01	.29644 01	.47651	.14034 01	.90183 00
5.00	.20	.65039 00	.33987	.44018	.17667 00	.10369 00	.17988 01	.13889 01	.30018	.78752 00	.22440 00
5.00	.50	.75758 00	.39286	.44643	.20980 00	.16026 00	.21250 01	.18700 01	.35294	.93777 00	.36483 00
5.00	.75	.80310 00	.41453	.45080	.22547 00	.18839 00	.22747 01	.20917 01	.37656	.10099 01	.44321 00
5.00	1.00	.83333 00	.42857	.45455	.23674 00	.20833 00	.23800 01	.22440 01	.39286	.10625 01	.50346 00
5.00	1.20	.85129 00	.43677	.45717	.24388 00	.22063 00	.24453 01	.23362 01	.40283	.10961 01	.54294 00
5.00	1.40	.86563 00	.44324	.45952	.24987 00	.23067 00	.24993 01	.24107 01	.41098	.11246 01	.57671 00
5.00	1.60	.87738 00	.44848	.46164	.25500 00	.23904 00	.25449 01	.24724 01	.41779	.11493 01	.60601 00
5.00	1.80	.88719 00	.45282	.46355	.25946 00	.24614 00	.25840 01	.25242 01	.42358	.11708 01	.63172 00
5.00	2.00	.89552 00	.45648	.46528	.26339 00	.25223 00	.26180 01	.25685 01	.42857	.11900 01	.65450 00
5.00	2.50	.91174 00	.46353	.46897	.27147 00	.26426 00	.26866 01	.26554 01	.43853	.12299 01	.70158 00
5.00	3.00	.92356 00	.46859	.47197	.27778 00	.27317 00	.27388 01	.27192 01	.44599	.12615 01	.73839 00
5.00	4.00	.93967 00	.47541	.47651	.28706 00	.28549 00	.28134 01	.28069 01	.45648	.13090 01	.79240 00
5.00	5.00	.95015 00	.47979	.47979	.29361 00	.29361 00	.28643 01	.28643 01	.46353	.13433 01	.83020 00
5.00	7.00	.96299 00	.48509	.48421	.30231 00	.30368 00	.29298 01	.29351 01	.47242	.13900 01	.87975 00
5.00	10.00	.97329 00	.48930	.48811	.30994 00	.31184 00	.29850 01	.29923 01	.47979	.14322 01	.92241 00
7.00	.20	.73176 00	.37485	.45634	.21064 00	.13988 00	.20982 01	.17235 01	.34270	.95394 00	.35576 00
7.00	.50	.81667 00	.41667	.46082	.23825 00	.19216 00	.23646 01	.21380 01	.38527	.10810 01	.47710 00
7.00	.75	.85186 00	.43354	.46396	.25089 00	.21652 00	.24833 01	.23205 01	.40391	.11400 01	.54982 00
7.00	1.00	.87500 00	.44444	.46667	.25985 00	.23333 00	.25656 01	.24435 01	.41667	.11823 01	.60368 00
7.00	1.20	.88866 00	.45080	.46857	.26547 00	.24354 00	.26163 01	.25171 01	.42444	.12091 01	.63819 00
7.00	1.40	.89954 00	.45582	.47028	.27015 00	.25180 00	.26580 01	.25763 01	.43078	.12316 01	.66728 00
7.00	1.60	.90841 00	.45988	.47181	.27414 00	.25864 00	.26930 01	.26249 01	.43607	.12510 01	.69225 00
7.00	1.80	.91582 00	.46325	.47320	.27760 00	.26441 00	.27229 01	.26657 01	.44057	.12679 01	.71395 00
7.00	2.00	.92209 00	.46609	.47447	.28064 00	.26933 00	.27489 01	.27004 01	.44444	.12828 01	.73304 00
7.00	2.50	.93428 00	.47156	.47716	.28685 00	.27900 00	.28011 01	.27682 01	.45217	.13137 01	.77709 00
7.00	3.00	.94313 00	.47550	.47935	.29167 00	.28612 00	.28406 01	.28177 01	.45795	.13381 01	.80229 00
7.00	4.00	.95517 00	.48080	.48268	.29872 00	.29590 00	.28968 01	.28855 01	.46609	.13744 01	.84613 00
7.00	5.00	.96299 00	.48421	.48509	.30368 00	.30231 00	.29351 01	.29298 01	.47156	.14005 01	.87651 00
7.00	7.00	.97254 00	.48834	.48834	.31022 00	.31022 00	.29841 01	.29841 01	.47847	.14358 01	.91601 00
7.00	10.00	.98200 00	.49163	.49122	.31594 00	.31661 00	.30253 01	.30278 01	.48421	.14676 01	.94974 00
10.00	.20	.80141 00	.40578	.46894	.24101 00	.17788 00	.23613 01	.20433 01	.38089	.11045 01	.46217 00
10.00	.50	.86580 00	.43750	.47207	.26276 00	.22297 00	.25681 01	.23800 01	.41374	.12057 01	.59236 00
10.00	.75	.89200 00	.45017	.47428	.27248 00	.24293 00	.26582 01	.25230 01	.42788	.12515 01	.65523 00
10.00	1.00	.90909 00	.45833	.47619	.27929 00	.25641 00	.27200 01	.26180 01	.43750	.12840 01	.70047 00
10.00	1.20	.91914 00	.46309	.47754	.28353 00	.26450 00	.27578 01	.26744 01	.44334	.13044 01	.72895 00
10.00	1.40	.92711 00	.46684	.47875	.28705 00	.27100 00	.27888 01	.27195 01	.44810	.13215 01	.75289 00
10.00	1.60	.93361 00	.46989	.47984	.29004 00	.27635 00	.28147 01	.27564 01	.45207	.13361 01	.77288 00
10.00	1.80	.93901 00	.47241	.48082	.29261 00	.28083 00	.28369 01	.27872 01	.45543	.13488 01	.79031 00
10.00	2.00	.94359 00	.47453	.48172	.29487 00	.28465 00	.28560 01	.28134 01	.45833	.13600 01	.80554 00
10.00	2.50	.95246 00	.47862	.48364	.29947 00	.29212 00	.28943 01	.28643 01	.46411	.13831 01	.83646 00
10.00	3.00	.95890 00	.48158	.48520	.30303 00	.29758 00	.29233 01	.29015 01	.46844	.14011 01	.86016 00
10.00	4.00	.96763 00	.48555	.48758	.30821 00	.30506 00	.29644 01	.29521 01	.47453	.14280 01	.89426 00
10.00	5.00	.97329 00	.48811	.48930	.31184 00	.30994 00	.29923 01	.29850 01	.47862	.14472 01	.91772 00
10.00	7.00	.98200 00	.49122	.49163	.31661 00	.31594 00	.30278 01	.30253 01	.48381	.14730 01	.94801 00
10.00	10.00	.98573 00	.49369	.49369	.32076 00	.32076 00	.30577 01	.30577 01	.48811	.14961 01	.97370 00



APPENDIXES

A. Symbols for Appendix B*

a	x coordinate of Eq.(2. 1a) at $y = z = 0$, [L]	**
b	y coordinate of Eq.(2. 1a) at $x = z = 0$, [L]	
c	z coordinate of Eq.(2. 1a) at $x = y = 0$, [L]	
x, y, z	rectangular coordinates of Eq.(2. 1a), [L]	
A_a	area enclosed by first quadrant of Eq.(1a), [L ²]	
$\left. \begin{array}{l} \bar{x}_{vg} \\ \bar{y}_{vg} \\ \bar{z}_{vg} \end{array} \right\}$	$\left\{ \begin{array}{l} \text{rectangular coordinates of the centroid of the first} \\ \text{octant of the solid volume, or mass, enclosed by Eq.(2. 1), [L]} \end{array} \right.$	
V_{vg}	first octant volume enclosed by the three intersecting planes and Eq.(2. 1), [L ³]	
m_{vg}	mass of a uniform density volume V_{vg} , [M]	
$\left. \begin{array}{l} I_{xvg} \\ I_{yvg} \\ I_{zvg} \end{array} \right\}$	$\left\{ \begin{array}{l} \text{mass moment of inertia of } m_{vg} \text{ with respect} \\ \text{to the x-, y-, and z- axes respectively, [ML}^2\text{]} \end{array} \right.$	
$\Gamma(n)$	gamma function of n, [1]	
ρ	mass density, [ML ⁻³]	
α, β, γ	exponents of the absolute value of $x/a, y/b, z/c$ respectively, [1]	

* Most of the material in Appendix B is reproduced from Reference [1] with the permission of the editor of Product Engineering magazine, McGraw-Hill Publishing Company, Inc., New York, New York.

** The dimensional notation [L] indicates a length while [M] indicates mass and [1] indicates a dimensionless quantity.

B. Volumes, Centroids and Moments of Inertia of Bodies Defined by Eq. (2. 1)

1. Volumes

Equation (2. 1) is reproduced here for convenience, along with Eqs. (1a), (2a) and (5a) from the first report [4].

$$\left| \frac{x}{a} \right|^a + \left| \frac{y}{b} \right|^\beta + \left| \frac{z}{c} \right|^\gamma = 1 \quad (2. 1a)^*$$

$$\left| \frac{x}{a} \right|^a + \left| \frac{y}{b} \right|^\beta = 1 \quad (1a)$$

$$A_a = \int_0^a y dx = b \int_0^a \left[1 - \left| \frac{x}{a} \right|^a \right]^{1/\beta} dx \quad (2a)$$

$$A_a = ab \left[\frac{\Gamma(\frac{1}{a} + 1) \Gamma(\frac{1}{\beta} + 1)}{\Gamma(\frac{1}{a} + \frac{1}{\beta} + 1)} \right] \quad (5a)$$

The volume bounded by the three coordinate planes and by Eq. (2. 1a) may be established by applying equations of the form of Eqs. (2a) and (5a) to yield

$$\begin{aligned} V_{vg} &= \int_0^a y \Big|_{z=0} z \Big|_{y=0} \left[\frac{\Gamma(\frac{1}{\beta} + 1) \Gamma(\frac{1}{\gamma} + 1)}{\Gamma(\frac{1}{\beta} + \frac{1}{\gamma} + 1)} \right] dx \\ &= bc \left[\frac{\Gamma(\frac{1}{\beta} + 1) \Gamma(\frac{1}{\gamma} + 1)}{\Gamma(\frac{1}{\beta} + \frac{1}{\gamma} + 1)} \right] \int_0^a \left[1 - \left| \frac{x}{a} \right|^a \right]^{\frac{1}{\beta} + \frac{1}{\gamma}} dx \quad (2. 2a) \end{aligned}$$

The notation $y \Big|_{z=0} z \Big|_{y=0}$ in Eq. (2. 2a), indicates that the evaluations are performed in the respective coordinate planes.

* The letter, a, after the number indicates equation appears in the appendix.

Equation (2.2a) has the following solution.

$$V_{vg} = abc \left[\frac{\Gamma(\frac{1}{a} + 1) \Gamma(\frac{1}{\beta} + 1) \Gamma(\frac{1}{\gamma} + 1)}{\Gamma(\frac{1}{a} + \frac{1}{\beta} + \frac{1}{\gamma} + 1)} \right] \quad (2.3a)$$

2. Centroids

The integral for the x- coordinate of the centroid of the volume is obtained from

$$V_{vg} \bar{x}_{vg} = \int_0^a y \Big|_{z=0} z \Big|_{y=0} \left[\frac{\Gamma(\frac{1}{\beta} + 1) \Gamma(\frac{1}{\gamma} + 1)}{\Gamma(\frac{1}{\beta} + \frac{1}{\gamma} + 1)} \right] x dx \quad (2.4a)$$

After solving for \bar{x}_{vg} and simplifying,

$$\bar{x}_{vg} = \frac{a}{2} \left[\frac{\Gamma(\frac{2}{a} + 1) \Gamma(\frac{1}{\beta} + \frac{1}{\gamma} + 1)}{\Gamma(\frac{1}{a} + 1) \Gamma(\frac{2}{a} + \frac{1}{\beta} + \frac{1}{\gamma} + 1)} \right] \quad (2.5a)$$

Similar expressions for \bar{y}_{vg} and \bar{z}_{vg} result from permutation of a, b and c as well as a , β and γ in Eq.(2.5a).

3. Moments of Inertia

The moment of inertia about the x-axis of the first octant volume element can be evaluated by selecting a differential volume parallel to the yz plane and integrating over the range for x. This permits the use of the polar moment of inertia relation for the differential volume element parallel to the yz plane.

$$I_x = I_y + I_z \quad (2.6a)$$

Equation (10a) from [4], is repeated for convenience.

$$I_{xa} = \frac{ab^3}{3} \left[\frac{\Gamma(\frac{1}{a} + 1) \Gamma(\frac{3}{\beta} + 1)}{\Gamma(\frac{1}{a} + \frac{3}{\beta} + 1)} \right] \quad (10a)$$

Applying Eq.(10a) with suitable notation change allows I_{xvg} , the mass moment of inertia of the general volume octant, with respect to x-axis, to be expressed as

$$\begin{aligned}
I_{xvz} = & \frac{1}{3} \rho \int_0^a y \Big|_{z=0} z^3 \Big|_{y=0} \left[\frac{\Gamma(\frac{1}{\beta} + 1) \Gamma(\frac{3}{\gamma} + 1)}{\Gamma(\frac{1}{\beta} + \frac{3}{\gamma} + 1)} \right] dx \\
& + \frac{1}{3} \rho \int_0^a y^3 \Big|_{z=0} z \Big|_{y=0} \left[\frac{\Gamma(\frac{3}{\beta} + 1) \Gamma(\frac{1}{\gamma} + 1)}{\Gamma(\frac{3}{\beta} + \frac{1}{\gamma} + 1)} \right] dx \quad (2.7a)
\end{aligned}$$

Substituting y and z in terms of x and applying formula 855.1 from Dwight [9], which follows

$$\int_0^1 u^{(m-1)} (1-u)^{n-1} du = \frac{\Gamma(m) \Gamma(n)}{\Gamma(m+n)} \quad (2.8a)$$

one obtains

$$\begin{aligned}
I_{xvz} = & \frac{abc}{3} \rho \left\{ b^2 \left[\frac{\Gamma(\frac{1}{a} + 1) \Gamma(\frac{3}{\beta} + 1) \Gamma(\frac{1}{\gamma} + 1)}{\Gamma(\frac{1}{a} + \frac{3}{\beta} + \frac{1}{\gamma} + 1)} \right] \right. \\
& \left. + c^2 \left[\frac{\Gamma(\frac{1}{a} + 1) \Gamma(\frac{1}{\beta} + 1) \Gamma(\frac{3}{\gamma} + 1)}{\Gamma(\frac{1}{a} + \frac{1}{\beta} + \frac{3}{\gamma} + 1)} \right] \right\} \quad (2.9a)
\end{aligned}$$

The values of I_{yvz} and I_{zvg} are again obtained by permutation of a , b and c as well as a , β and γ within the braces in Eq.(2.9a).

C. FORTRAN Program

The computer program for Table I contains a main program and a subroutine DUBINT. The subroutine evaluates the double integrals using the Gaussian quadrature rule with n points. The evaluated values stored in arguments are as following

$$\begin{aligned} \text{AREA} &= \iint F(X, Y) \, dYdX \\ \text{XBARS} &= \iint XF(X, Y) \, dYdX \\ \text{YBARS} &= \iint YF(X, Y) \, dYdX \\ \text{ZBARS} &= \iiint \left[1 - X^a - Y^\beta \right]^{1/\gamma} F(X, Y) \, dYdX \\ \text{GIXYS} &= \iiint \left[1 - X^a - Y^\beta \right]^{2/\gamma} F(X, Y) \, dYdX \\ \text{GIYZS} &= \iint X^2 F(X, Y) \, dYdX \\ \text{GIZXS} &= \iint Y^2 F(X, Y) \, dYdX \end{aligned}$$

The function $F(X, Y)$ is given in the FUNCTION subprogram.

The main program first reads in the $\frac{n}{2}$ zeros and the $\frac{n}{2}$ weights of the Gaussian quadrature according to FORMAT (4F20.0). Then it reads in the number of sets of values $P(= \frac{b}{a})$ and $Q(= \frac{c}{a})$, followed by the values of P and Q with FORMAT (8F10.0). Each data card contains a set of values a, β and γ , as well as a control number (NC) which designates the group to which the set belongs. The group numbers (NC) are listed on page 16. Further an (SL) value is read in for groups 2, 3, and 4 on which two regions of integration are calculated. The individual values of (SL), for NC=3 for example, represent the point at which the plane $\frac{x}{a} = \frac{z}{c}$, the surface of Eq. (2.3) and x-z plane intersect. In addition to the (SL) value, there is an (SLT) value to be read in for group NC=1, which involves three regions of integration. The (SLT) value is corresponding to y_2 in Fig. 4. which should be chosen greater than y_1 , so that three pieces can be cut as shown in Fig. 4.

PROGRAM FOR TABLE I

CALL FTRAP	3DSHE001
DIMENSION X(32), Y(32), WI(32), PV(20), QV(20)	3DSHE002
COMMON ALPHA, BETA, GAMMA, P, Q	3DSHE003
READ INPUT TAPE 7,1, (X(I),I=1,32),(WI(I),I=1,32)	3DSHE004
1 FORMAT (4F20.10)	3DSHE005
DO 2 K=1,32	3DSHE006
2 Y(K) = X(K)	3DSHE007
READ INPUT TAPE 7,3, NPQ	3DSHE008
3 FORMAT (I5)	3DSHE009
READ INPUT TAPE 7,4, (PV(I), QV(I), I=1,NPQ)	3DSHE010
4 FORMAT (8F10.0)	3DSHE011
L = 0	3DSHE012
100 READ INPUT TAPE 7,5, ALPHA, BETA, GAMMA, NC, SL, SLT	3DSHE013
5 FORMAT (3F5.0,1I0,2F10.0)	3DSHE014
I = L + 1	3DSHE015
GO TO (81, 83, 83, 82), L	3DSHE016
81 WRITE OUTPUT TAPE 6, 6	3DSHE017
6 FORMAT (1H1)	3DSHE018
GO TO 101	3DSHE019
82 L = 0	3DSHE020
83 WRITE OUTPUT TAPE 6, 7	3DSHE021
7 FORMAT (1H)	3DSHE022
101 DO 200 I=1,NPQ	3DSHE023
P = PV(I)	3DSHE024
Q = QV(I)	3DSHE025
C	3DSHE026
AREAXY = 0.0	3DSHE027
AREAYZ = 0.0	3DSHE028
AREAZX = 0.0	3DSHE029
XBXY = 0.0	3DSHE030
XBYZ = 0.0	3DSHE031
XBZX = 0.0	3DSHE032
YBXY = 0.0	3DSHE033
YBYZ = 0.0	3DSHE034
YBZX = 0.0	3DSHE035
ZBXY = 0.0	3DSHE036
ZBYZ = 0.0	3DSHE037
ZBZX = 0.0	3DSHE038
GIXYXY = 0.0	3DSHE039
GIXYYZ = 0.0	3DSHE040
GIXYZX = 0.0	3DSHE041
GIYZXY = 0.0	3DSHE042
GIYZYZ = 0.0	3DSHE043
GIYZZX = 0.0	3DSHE044
GIZXXY = 0.0	3DSHE045
GIZXYZ = 0.0	3DSHE046
GIZZXZ = 0.0	3DSHE047
GO TO (10, 20, 30, 40, 50, 60, 70, 20), NC	3DSHE048
C	3DSHE049
10 NC = 1	3DSHE050
C INTEGRATE WITH RESPECT TO YX	3DSHE051
F FXY	3DSHE052
CALL DUBINT (FX,Y,WI,X,Y,ALPHA,BETA,GAMMA,2,0,SL,1.,SLT,	3DSHE053
1 AREA,XBARS,YBARS,ZBARS,GIXYS,GIYZS,GIZXS)	3DSHE054
AREAXY=P*AREA	3DSHE055
XBXY=P*XBARS	3DSHE056
YBXY=P*YBARS	3DSHE057
ZBXY=P*ZBARS	3DSHE058
GIXYXY=P*Q*Q*GIXYS	3DSHE059
GIYZXY=P*GIYZS	3DSHE060
GIZXXY=P*P*GIZXS	3DSHE061
B = (1.-(SL**ALPHA))**(1./BETA)	3DSHE062
C INTEGRATE WITH RESPECT TO ZY	3DSHE063
F FYZ	3DSHE064
CALL DUBINT (FYZ,WI,X,Y,BETA,GAMMA,ALPHA,2,0,8,1.,SL,	3DSHE065
1 AREA,XBARS,YBARS,ZBARS,GIXYS,GIYZS,GIZXS)	

	AREAYZ=P*Q*AREA	3DSHE066
	XBYZ=P*Q*ZBARS	3DSHE067
	YBYZ=P*Q*XBARS	3DSHE068
	ZBYZ=P*Q*YBARS	3DSHE069
	GIXYYZ=P*Q*Q*Q*GIZXS	3DSHE070
	GIYZYZ= P*Q*GIXYS	3DSHE071
	GIZXYZ=P*P*P*Q*GIYZS	3DSHE072
C	INTEGRATE WITH RESPECT TO ZX	3DSHE073
F	FXZ	3DSHE074
	CALL DUBINT (FXZ,WI,X,Y,ALPHA,GAMMA,BETA,1,0,SL,1.,SLT,	3DSHE075
1	AREA,XBARS,YBARS,ZBARS,GIXYS,GIYZS,GIZXS)	3DSHE076
	AREAZX=Q*AREA	3DSHE077
	XBZX=Q*XBARS	3DSHE078
	YBZX=Q*ZBARS	3DSHE079
	ZBZX=Q*YBARS	3DSHE080
	GIXYZX=Q*Q*Q*GIZXS	3DSHE081
	GIYZZX=Q*GIYZS	3DSHE082
	GIZZX=P*P*Q*GIXYS	3DSHE083
	GO TO 150	3DSHE084
C		3DSHE085
20	NC = 2	3DSHE086
C	INTEGRATE WITH RESPECT TO ZY	3DSHE087
F	FYZ	3DSHE088
	CALL DUBINT (FYZ,WI,X,Y,BETA,GAMMA,ALPHA,3, 0.0, SL,0.0,	3DSHE089
1	AREA,XBARS,YBARS,ZBARS,GIXYS,GIYZS,GIZXS)	3DSHE090
	AREAYZ = P*Q*AREA	3DSHE091
	XBYZ = P*Q*ZBARS	3DSHE092
	YBYZ = P*Q*XBARS	3DSHE093
	ZBYZ = P*Q*YBARS	3DSHE094
	GIXYYZ = P*Q*Q*Q*GIZXS	3DSHE095
	GIYZYZ = P*Q*GIXYS	3DSHE096
	GIZXYZ = P*P*P*Q*GIYZS	3DSHE097
	CALL DUBINT (FYZ,WI,X,Y,BETA,GAMMA,ALPHA,3,SL,1.0,1.0,0,	3DSHE098
1	AREA,XBARS,YBARS,ZBARS,GIXYS,GIYZS,GIZXS)	3DSHE099
	AREAYZ = AREAYZ + P*Q*AREA	3DSHE100
	XBYZ = XBYZ + P*Q*ZBARS	3DSHE101
	YBYZ = YBYZ + P*Q*XBARS	3DSHE102
	ZBYZ = ZBYZ + P*Q*YBARS	3DSHE103
	GIXYYZ = GIXYYZ + P*Q*Q*Q*GIZXS	3DSHE104
	GIYZYZ = GIYZYZ + P*Q*GIXYS	3DSHE105
	GIZXYZ = GIZXYZ + P*P*P*Q*GIYZS	3DSHE106
C	INTEGRATE WITH RESPECT TO ZX	3DSHE107
F	FXZ	3DSHE108
	CALL DUBINT (FXZ,WI,X,Y,ALPHA,GAMMA,BETA,3, 0.0, SL,0.0,	3DSHE109
1	AREA,XBARS,YBARS,ZBARS,GIXYS,GIYZS,GIZXS)	3DSHE110
	AREAZX = Q*AREA	3DSHE111
	XBZX = Q*XBARS	3DSHE112
	YBZX = Q*ZBARS	3DSHE113
	ZBZX = Q*YBARS	3DSHE114
	GIXYZX = Q*Q*Q*GIZXS	3DSHE115
	GIYZZX = Q*GIYZS	3DSHE116
	GIZZX = P*P*Q*GIXYS	3DSHE117
	CALL DUBINT (FXZ,WI,X,Y,ALPHA,GAMMA,BETA,3,SL,1.0,1.0,0,	3DSHE118
1	AREA,XBARS,YBARS,ZBARS,GIXYS,GIYZS,GIZXS)	3DSHE119
	AREAZX = AREAZX + Q*AREA	3DSHE120
	XBZX = XBZX + Q*XBARS	3DSHE121
	YBZX = YBZX + Q*ZBARS	3DSHE122
	ZBZX = ZBZX + Q*YBARS	3DSHE123
	GIXYZX = GIXYZX + Q*Q*Q*GIZXS	3DSHE124
	GIYZZX = GIYZZX + Q*GIYZS	3DSHE125
	GIZZX = GIZZX + P*P*Q*GIXYS	3DSHE126
	GO TO 150	3DSHE127
C		3DSHE128
30	NC = 3	3DSHE129
C	INTEGRATE WITH RESPECT TO YX	3DSHE130
F	FXY	3DSHE131
	CALL DUBINT (FXY,WI,X,Y,ALPHA,BETA,GAMMA,3,0,SL,0.0,	3DSHE132
1	AREA,XBARS,YBARS,ZBARS,GIXYS,GIYZS,GIZXS)	3DSHE133

	AREAXY = P*AREA	3DSHE134
	XBXY = P*XBARS	3DSHE135
	YBXY = P*YBARS	3DSHE136
	ZBXY = P*ZBARS	3DSHE137
	GIXYXY = P*Q*Q*GIXYS	3DSHE138
	GIYZXY = P*GIYZS	3DSHE139
	GIZXXY = P*P*P*GIZXS	3DSHE140
	CALL DUBINT (FX,Y,WI,X,Y,ALPHA,BETA,GAMMA,3,SL,1.0,1.0,0,	3DSHE141
	1 AREA,XBARS,YBARS,ZBARS,GIXYS,GIYZS,GIZXS)	3DSHE142
	AREAXY = AREAXY + P*AREA	3DSHE143
	XBXY = XBXY + P*XBARS	3DSHE144
	YBXY = YBXY + P*YBARS	3DSHE145
	ZBXY = ZBXY + P*ZBARS	3DSHE146
	GIXYXY = GIXYXY + P*Q*Q*GIXYS	3DSHE147
	GIYZXY = GIYZXY + P*GIYZS	3DSHE148
	GIZXXY = GIZXXY + P*P*P*GIZXS	3DSHE149
C	INTEGRATE WITH RESPECT TO YZ	3DSHE150
F	FZY	3DSHE151
	CALL DUBINT (FZY,WI,X,Y,GAMMA,BETA,ALPHA,3,0.0,CL,0,0,	3DSHE152
	1 AREA,XBARS,YBARS,ZBARS,GIXYS,GIYZS,GIZXS)	3DSHE153
	AREAYZ = P*Q*AREA	3DSHE154
	XBZY = P*Q*ZBARS	3DSHE155
	YBYZ = P*Q*YBARS	3DSHE156
	ZBYZ = P*Q*XBARS	3DSHE157
	GIXYYZ = P*Q*Q*Q*GIYZS	3DSHE158
	GIYZYZ = P*Q*GIXYS	3DSHE159
	GIZXYZ = P*P*P*Q*GIZXS	3DSHE160
	CALL DUBINT (FZY,WI,X,Y,GAMMA,BETA,ALPHA,3,SL,1.0,1.0,0,	3DSHE161
	1 AREA,XBARS,YBARS,ZBARS,GIXYS,GIYZS,GIZXS)	3DSHE162
	AREAYZ = AREAYZ + P*Q*AREA	3DSHE163
	XBZY = XBZY + P*Q*ZBARS	3DSHE164
	YBYZ = YBYZ + P*Q*YBARS	3DSHE165
	ZBYZ = ZBYZ + P*Q*XBARS	3DSHE166
	GIXYYZ = GIXYYZ + P*Q*Q*Q*GIYZS	3DSHE167
	GIYZYZ = GIYZYZ + P*Q*GIXYS	3DSHE168
	GIZXYZ = GIZXYZ + P*P*P*Q*GIZXS	3DSHE169
	GO TO 150	3DSHE170
C		3DSHE171
	40 NC = 4	3DSHE172
C	INTEGRATE WITH RESPECT TO XZ	3DSHE173
F	FZX	3DSHE174
	CALL DUBINT (FZX,WI,X,Y,GAMMA,ALPHA,BETA,3,0,SL,0,0,	3DSHE175
	1 AREA,XBARS,YBARS,ZBARS,GIXYS,GIYZS,GIZXS)	3DSHE176
	AREAZX = Q*AREA	3DSHE177
	XBZX = Q*YBARS	3DSHE178
	YBZX = Q*ZBARS	3DSHE179
	ZBZX = Q*XBARS	3DSHE180
	GIXYZX = Q*Q*Q*GIYZS	3DSHE181
	GIYZZX = Q*GIZXS	3DSHE182
	GIZZXZ = P*P*Q*GIXYS	3DSHE183
	CALL DUBINT (FZX,WI,X,Y,GAMMA,ALPHA,BETA,3,SL,1.0,1.0,0,	3DSHE184
	1 AREA,XBARS,YBARS,ZBARS,GIXYS,GIYZS,GIZXS)	3DSHE185
	AREAZX = AREAZX + Q*AREA	3DSHE186
	XBZX = XBZX + Q*YBARS	3DSHE187
	YBZX = YBZX + Q*ZBARS	3DSHE188
	ZBZX = ZBZX + Q*XBARS	3DSHE189
	GIXYZX = GIXYZX + Q*Q*Q*GIYZS	3DSHE190
	GIYZZX = GIYZZX + Q*GIZXS	3DSHE191
	GIZZXZ = GIZZXZ + P*P*Q*GIXYS	3DSHE192
C	INTEGRATE WITH RESPECT TO XY	3DSHE193
F	FYX	3DSHE194
	CALL DUBINT (FYX,WI,X,Y,BETA,ALPHA,GAMMA,3,0,SL,0,0,	3DSHE195
	1 AREA,XBARS,YBARS,ZBARS,GIXYS,GIYZS,GIZXS)	3DSHE196
	AREAXY = P*AREA	3DSHE197
	XBXY = P*YBARS	3DSHE198
	YBXY = P*XBARS	3DSHE199
	ZBXY = P*ZBARS	3DSHE200
	GIXYXY = P*Q*Q*GIXYS	3DSHE201
	GIYZXY = P*GIZXS	3DSHE202
	GIZXXY=P*P*P*GIYZS	3DSH5203
	CALL DUBINT (FYX,WI,X,Y,BETA,ALPHA,GAMMA,3,SL,1.0,1.0,0,	3DSHE204
	1 AREA,XBARS,YBARS,ZBARS,GIXYS,GIYZS,GIZXS)	3DSHE205

	AREAXY = AREAXY + P*AREA	3DSHE206
	XBXY = XBXY + P*YBARS	3DSHE207
	YBXY = YBXY + P*XBARS	3DSHE208
	ZBXY = ZBXY + P*ZBARS	3DSHE209
	GIXYXY = GIXYXY + P*Q*Q*GIXYS	3DSHE210
	GIYZXY = GIYZXY + P*GIZXS	3DSHE211
	GIZXXY = GIZXXY + P*P*P*GIYZS	3DSHE212
	GO TO 150	3DSHE213
C		3DSHE214
50	NC = 5	3DSHE215
C	INTEGRATE WITH RESPECT TO YX	3DSHE216
F	FXI	3DSHE217
	CALL DUBINT (FXI,WI,X,Y,ALPHA,BETA,GAMMA,2,0,1.0,1.0,0,	3DSHE218
	1 AREA,XBARS,YBARS,ZBARS,GIXYS,GIYZS,GIZXS)	3DSHE219
	AREAXY=P*AREA	3DSHE220
	XBXY=P*XBARS	3DSHE221
	YBXY=P*YBARS	3DSHE222
	ZBXY=P*ZBARS	3DSHE223
	GIXYXY=P*Q*Q*GIXYS	3DSHE224
	GIYZXY=P*GIYZS	3DSHE225
	GIZXXY=P*P*P*GIZXS	3DSHE226
	GO TO 150	3DSHE227
C		3DSHE228
60	NC = 6	3DSHE229
C	INTEGRATE WITH RESPECT TO XZ	3DSHE230
F	FZX	3DSHE231
	CALL DUBINT (FZX,WI,X,Y,GAMMA,ALPHA,BETA,2,0,1.0,1.0,0,	3DSHE232
	1 AREA,XBARS,YBARS,ZBARS,GIXYS,GIYZS,GIZXS)	3DSHE233
	AREAZX=Q*AREA	3DSHE234
	XBZX=Q*YBARS	3DSHE235
	YBZX=Q*ZBARS	3DSHE236
	ZBZX=Q*XBARS	3DSHE237
	GIXYZX=Q*Q*Q*GIYZS	3DSHE238
	GIYZZX=Q*GIZXS	3DSHE239
	GIZXXZ=P*P*Q*GIXYS	3DSHE240
	GO TO 150	3DSHE241
C		3DSHE242
70	NC = 7	3DSHE243
C	INTEGRATE WITH RESPECT TO ZY	3DSHE244
F	FYZ	3DSHE245
	CALL DUBINT (FYZ,WI,X,Y,BETA,GAMMA,ALPHA,2,0,1.0,1.0,0,	3DSHE246
	1 AREA,XBARS,YBARS,ZBARS,GIXYS,GIYZS,GIZXS)	3DSHE247
	AREAYZ=P*Q*AREA	3DSHE248
	XBYZ=P*Q*ZBARS	3DSHE249
	YBYZ=P*Q*XBARS	3DSHE250
	ZBYZ=P*Q*YBARS	3DSHE251
	GIXYYZ=P*Q*Q*Q*GIZXS	3DSHE252
	GIYZYZ= P*Q*GIXYS	3DSHE253
	GIZXYZ=P*P*P*Q*GIYZS	3DSHE254
	GO TO 150	3DSHE255
C		3DSHE256
150	AREAT=AREAXY+AREAYZ+AREAZX	3DSHE257
	XBAR = (XBXY+XBYZ+XBZX)/AREAT	3DSHE258
	YBAR= (YBXY+YBYZ+YBZX) /AREAT	3DSHE259
	ZBAR= (ZBXY+ZBYZ+ZBZX) /AREAT	3DSHE260
	GIXY= GIXYXY+ GIXYYZ+ GIXYZX	3DSHE261
	GIYZ= GIYZXY+ GIYZYZ+ GIYZZX	3DSHE262
	GIZX= GIZXXY+ GIZXYZ+ GIZXXZ	3DSHE263
	GIX = GIXY+GIZX	3DSHE264
	GIY = GIYZ+GIXY	3DSHE265
	GIZ = GIYZ+GIZX	3DSHE266
	WRITE OUTPUT TAPE 6,199,P,Q,AREAT,XBAR,YBAR,ZBAR,GIX,GIY,GIZ,	3DSHE267
	1 ALPHA,BETA,GAMMA	3DSHE268
199	FORMAT (3H ,2F5.2,1X,7E10.5,15X,3F6.2)	3DSHE269
200	CONTINUE	3DSHE270
	GO TO 100	3DSHE271
	END	3DSHE272

SUBROUTINE DUBINT (AAAA, WI, X, Y, ALPHA, BETA, GAMMA, M, R, S, ZIC,	3DSUB001
1 Z2, AREA, XBARS, YBARS, ZBARS, GIXYS, GIYZS, GIZYS)	3DSUB002
DIMENSION X(32), Y(32), WI(32)	3DSUB003
AREA1=0.0	3DSUB004
XBAR1=0.0	3DSUB005
YBAR1=0.0	3DSUB006
ZBAR1=0.0	3DSUB007
GIXY1=0.0	3DSUB008
GIYZ1=0.0	3DSUB009
GIZX1=0.0	3DSUB010
DO 7 I=1,32	3DSUB011
AREAU=0.0	3DSUB012
AREAV=0.0	3DSUB013
SXAU=0.0	3DSUB014
SXAV=0.0	3DSUB015
SX2AU=0.0	3DSUB016
SX2AV=0.0	3DSUB017
SYAU=0.0	3DSUB018
SYAV=0.0	3DSUB019
SY2AU=0.0	3DSUB020
SY2AV=0.0	3DSUB021
SZAU=0.0	3DSUB022
SZAV=0.0	3DSUB023
SZ2AU=0.0	3DSUB024
SZ2AV=0.0	3DSUB025
C3=0.5*(S-R)	3DSUB026
C4=0.5*(S+R)	3DSUB027
UI=C3*X(I) +C4	3DSUB028
VI=-C3*X(I) +C4	3DSUB28A
IF (ZIC-1.0) 200,101,101	3DSUB28B
101 CU=0.0	3DSUB029
LV=0.0	3DSUB030
GO TO 102	3DSUB031
200 GO TO (100, 100, 201), M	3DSUB31A
100 CU=(1.0-(ZIC**GAMMA)-(UI**ALPHA))**(1./BETA)	3DSUB032
CV=(1.0-(ZIC**GAMMA)-(VI**ALPHA))**(1./BETA)	3DSUB033
GO TO 102	3DSUB33A
201 CU=(1.0-(UI**ALPHA)-(UI**GAMMA))**(1./BETA)	3DSUB33B
CV=(1.0-(VI**ALPHA)-(VI**GAMMA))**(1./BETA)	3DSUB33C
102 GO TO (104, 103, 103), M	3DSUB034
103 DU=(1.-(Z2**GAMMA)-(UI**ALPHA))**(1./BETA)	3DSUB035
DV=(1.-(Z2**GAMMA)-(VI**ALPHA))**(1./BETA)	3DSUB036
GO TO 105	3DSUB037
104 DU= Z2	3DSUB038
DV= Z2	3DSUB039
105 C1=0.5*(DU-CU)	3DSUB040
C2=0.5*(DV-CV)	3DSUB041
CC1= 0.5* (DU+CU)	3DSUB042
CC2= 0.5* (DV+CV)	3DSUB043
DO 8 J=1,32	3DSUB044
YUP= C1*Y(J) + CC1	3DSUB045
YUM= -C1*Y(J) + CC1	3DSUB046
YVP= C2*Y(J) + CC2	3DSUB047
YVM= -C2*Y(J) + CC2	3DSUB048
FA1= AAAA(UI, YUP)	3DSUB049
FA2= AAAA(UI, YUM)	3DSUB050
FA3= AAAA(VI, YVP)	3DSUB051
FA4= AAAA(VI, YVM)	3DSUB052
WFXYU= WI(J) * (FA1+FA2)	3DSUB053
WFXYV= WI(J) * (FA3+FA4)	3DSUB054
AREAU=AREAU+WFXYU	3DSUB055
AREAV=AREAV+WFXYV	3DSUB056
WXAU=WFXYU*UI	3DSUB057
WXAV=WFXYV*VI	3DSUB058
WX2AU=WXAU*UI	3DSUB059
WX2AV=WXAV*VI	3DSUB060
SXAU=SXAU+WXAU	3DSUB061
SXAV=SXAV+WXAV	3DSUB062
SX2AU=SX2AU+WX2AU	3DSUB063
SX2AV=SX2AV+WX2AV	3DSUB064

WYAU=WI(J)*(YUP*FA1+YUM*FA2)	3DSUB065
WYAV=WI(J)*(YVP*FA3+YVM*FA4)	3DSUB066
WY2AU=WI(J)*(YUP*YUP*FA1+YUM*YUM*FA2)	3DSUB067
WY2AV=WI(J)*(YVP*YVP*FA3+YVM*YVM*FA4)	3DSUB068
SYAU=SYAU+WYAU	3DSUB069
SYAV=SYAV+WYAV	3DSUB070
SY2AU=SY2AU+WY2AU	3DSUB071
SY2AV=SY2AV+WY2AV	3DSUB072
ZUP=(1.0-(UI**ALPHA)-(YUP**BETA))* (1.0/GAMMA)	3DSUB073
ZUM=(1.0-(UI**ALPHA)-(YUM**BETA))* (1.0/GAMMA)	3DSUB074
ZVP=(1.0-(VI**ALPHA)-(YVP**BETA))* (1.0/GAMMA)	3DSUB075
ZVM=(1.0-(VI**ALPHA)-(YVM**BETA))* (1.0/GAMMA)	3DSUB076
WZAU=WI(J)*(ZUP*FA1+ZUM*FA2)	3DSUB077
WZAV=WI(J)*(ZVP*FA3+ZVM*FA4)	3DSUB078
WZ2AU=WI(J)*(ZUP*ZUP*FA1+ZUM*ZUM*FA2)	3DSUB079
WZ2AV=WI(J)*(ZVP*ZVP*FA3+ZVM*ZVM*FA4)	3DSUB080
SZAU=SZAU+WZAU	3DSUB081
SZAV=SZAV+WZAV	3DSUB082
SZ2AU=SZ2AU+WZ2AU	3DSUB083
SZ2AV=SZ2AV+WZ2AV	3DSUB084
8 CONTINUE	3DSUB085
WA=WI(I)*(C1*AREAU+C2*AREAV)	3DSUB086
AREA1=AREA1+WA	3DSUB087
WTXB=WI(I)*(C1*SXAUC2*SXAV)	3DSUB088
XBAR1=XBAR1+WTXB	3DSUB089
WYB=WI(I)*(C1*SYAUC2*SYAV)	3DSUB090
YBAR1=YBAR1+WYB	3DSUB091
WZB=WI(I)*(C1*SZAUC2*SZAV)	3DSUB092
ZBAR1=ZBAR1+WZB	3DSUB093
WIXY=WI(I)*(C1*SX2AUC2*SX2AV)	3DSUB094
GIXY1=GIXY1+WIXY	3DSUB095
WIYZ=WI(I)*(C1*SY2AUC2*SY2AV)	3DSUB096
GIYZ1=GIYZ1+WIYZ	3DSUB097
WIZX=WI(I)*(C1*SZ2AUC2*SZ2AV)	3DSUB098
GIZX1=GIZX1+WIZX	3DSUB099
7 CONTINUE	3DSUB100
AREA=C3*AREA1	3DSUB101
XBARS =C3* XBAR1	3DSUB102
YBARS =C3* YBAR1	3DSUB103
ZBARS =C3* ZBAR1	3DSUB104
GIYZS =C3* GIXY1	3DSUB105
GIZXS =C3* GIYZ1	3DSUB106
GIXYS =C3* GIZX1	3DSUB107
RETURN	3DSUB108
END	3DSUB109

FUNCTION FXY(X,Y)	FXY001
COMMON ALPHA, BETA, GAMMA, P, Q	FXY002
A= 1.0-X**ALPHA-Y**BETA	FXY003
B=(1.0-GAMMA)/GAMMA	FXY004
AA=A**B	FXY005
C=Q*ALPHA*X** (ALPHA-1.0)/GAMMA	FXY006
CC=C**A	FXY007
CCC=CC*CC	FXY008
D= (Q/P)*BETA*Y** (BETA-1.)/GAMMA	FXY009
DD=D**A	FXY010
DDD=DD*DD	FXY011
FXY=SQRT(1.0+CCC+DDD)	FXY012
RETURN	FXY013
END	FXY014

```

FUNCTION FYZ(Y,Z)
COMMON ALPHA, BETA, GAMMA, P, Q
A= 1.0-Y**BETA-Z**GAMMA
B= (1.0-ALPHA)/ALPHA
AA=A**B
C= (BETA/P) *Y**(BETA-1.) /ALPHA
CC=C*AA
CCC=CC*CC
D= (GAMMA/Q) *Z**(GAMMA-1.) /ALPHA
DD=D*AA
DDD=DD*DD
FYZ=SQRT(1.0+CCC+DDD)
RETURN
END

```

```

FYZ001
FYZ002
FYZ003
FYZ004
FYZ005
FYZ006
FYZ007
FYZ008
FYZ009
FYZ010
FYZ011
FYZ012
FYZ013
FYZ014

```

```

FUNCTION FZX(Z,X)
COMMON ALPHA, BETA, GAMMA, P, Q
A= 1.0-X**ALPHA-Z**GAMMA
B= (1.0-BETA)/BETA
AA=A**B
C= P*ALPHA*X**(ALPHA-1.) /BETA
CC=C*AA
CCC=CC*CC
D= (P/Q)* GAMMA*Z**(GAMMA-1.) /BETA
DD=D*AA
DDD=DD*DD
FZX=SQRT(1.0+CCC+DDD)
RETURN
END

```

```

FZX001
FZX002
FZX003
FZX004
FZX005
FZX006
FZX007
FZX008
FZX009
FZX010
FZX011
FZX012
FZX013
FZX014

```

```

FUNCTION FZX(Y,X)
COMMON ALPHA, BETA, GAMMA, P, Q
A= 1.0-X**ALPHA-Y**BETA
B=(1.0-GAMMA)/GAMMA
AA=A**B
C=Q*ALPHA*X**(ALPHA-1.0)/GAMMA
CC=C*AA
CCC=CC*CC
D= (Q/P)*BETA*Y**(BETA-1.)/GAMMA
DD=D*AA
DDD=DD*DD
FZX=SQRT(1.0+CCC+DDD)
RETURN
END

```

```

FZX001
FZX002
FZX003
FZX004
FZX005
FZX006
FZX007
FZX008
FZX009
FZX010
FZX011
FZX012
FZX013
FZX014

```

```

FUNCTION FXZ(X,Z)
COMMON ALPHA, BETA, GAMMA, P, Q
A= 1.0-X**ALPHA-Z**GAMMA
B= (1.0-BETA)/BETA
AA=A**B
C= P*ALPHA*X**(ALPHA-1.) /BETA
CC=C*AA
CCC=CC*CC
D= (P/Q)* GAMMA*Z**(GAMMA-1.) /BETA
DD=D*AA
DDD=DD*DD
FXZ=SQRT(1.0+CCC+DDD)
RETURN
END

```

```

FXZ001
FXZ002
FXZ003
FXZ004
FXZ005
FXZ006
FXZ007
FXZ008
FXZ009
FXZ010
FXZ011
FXZ012
FXZ013
FXZ014

```

```

FUNCTION FZY(Z,Y)
COMMON ALPHA, BETA, GAMMA, P, Q
A= 1.0-Y**BETA-Z**GAMMA
B= (1.0-ALPHA)/ALPHA
AA=A**B
C= (BETA/P) *Y**(BETA-1.) /ALPHA
CC=C*AA
CCC=CC*CC
D= (GAMMA/Q) *Z**(GAMMA-1.) /ALPHA
DD=D*AA
DDD=DD*DD
FZY=SQRT(1.0+CCC+DDD)
RETURN
END

```

```

FZY001
FZY002
FZY003
FZY004
FZY005
FZY006
FZY007
FZY008
FZY009
FZY010
FZY011
FZY012
FZY013
FZY014

```

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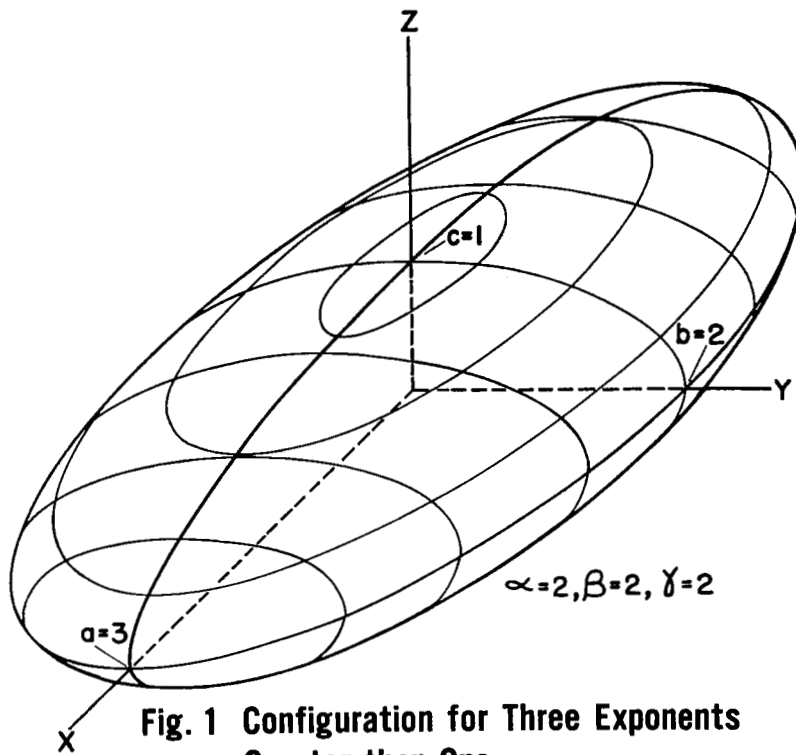


Fig. 1 Configuration for Three Exponents Greater than One

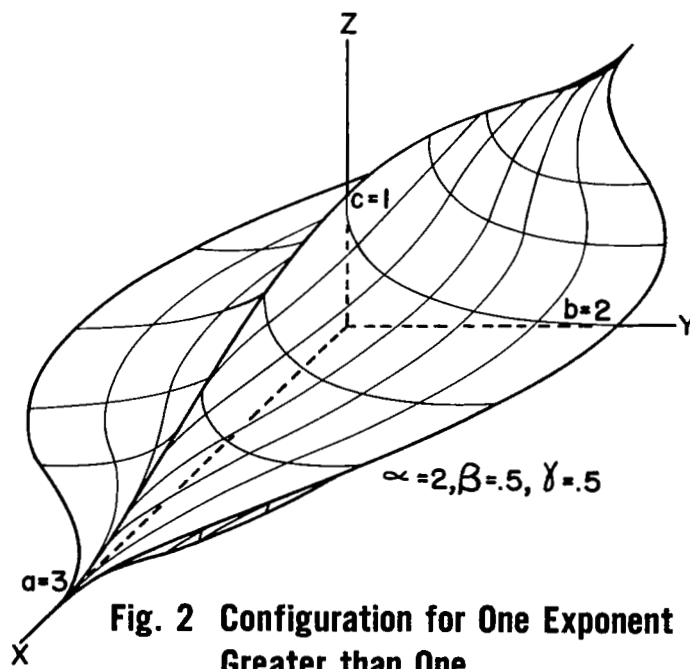


Fig. 2 Configuration for One Exponent Greater than One

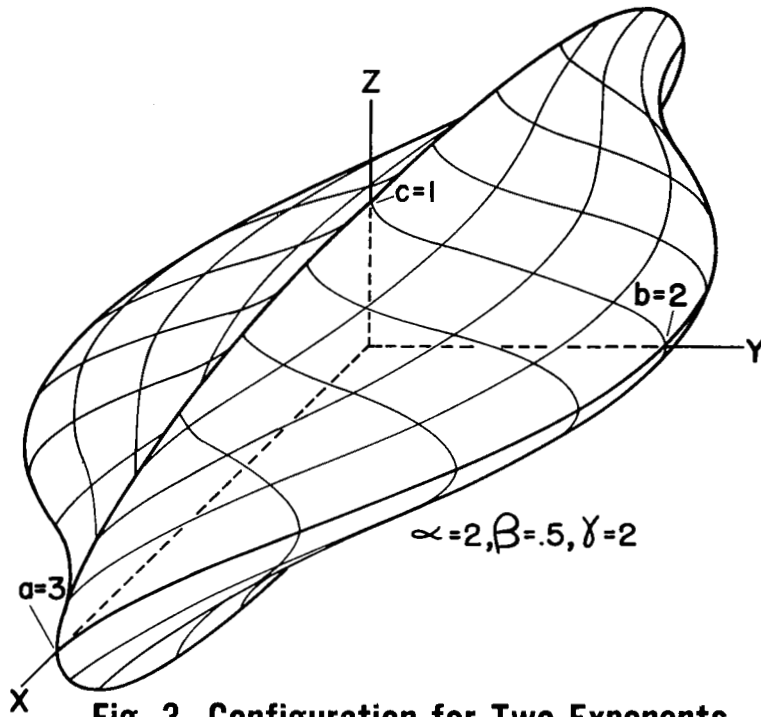


Fig. 3 Configuration for Two Exponents Greater than One

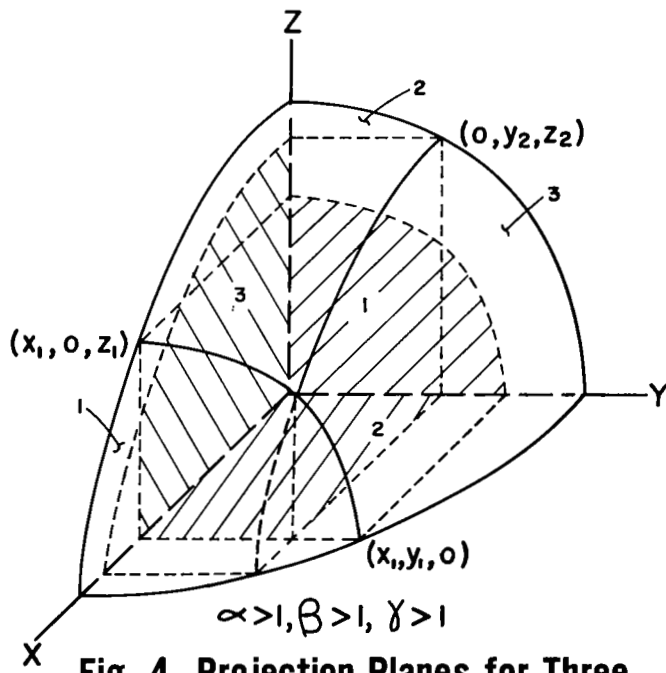


Fig. 4 Projection Planes for Three Region Integration

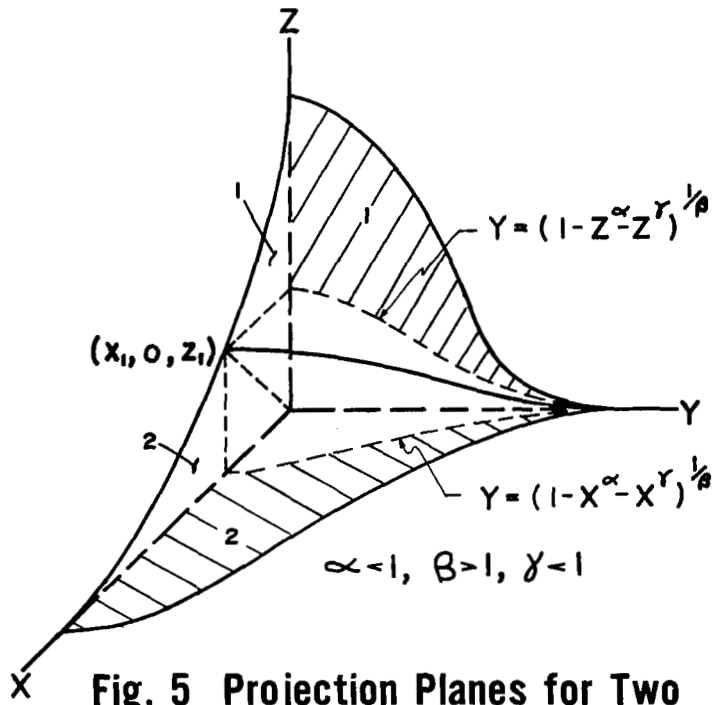


Fig. 5 Projection Planes for Two Region Integration

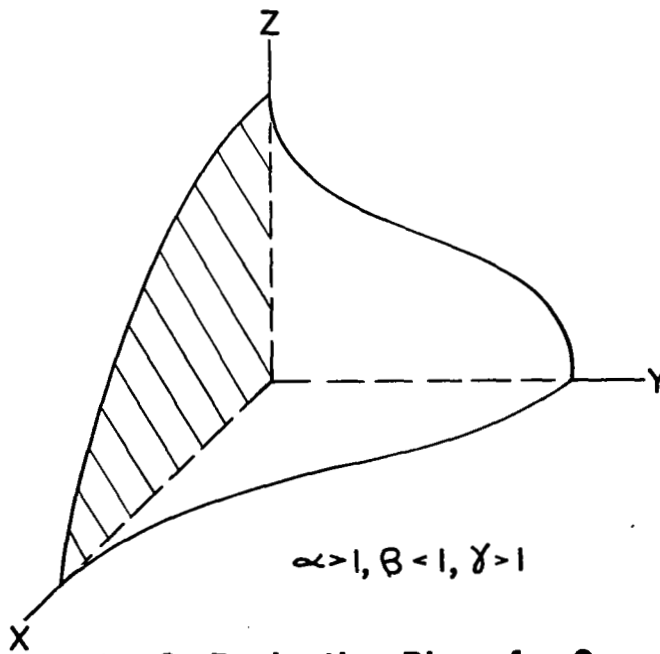


Fig. 6 Projection Plane for One Region Integration