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TECHNICAL NOTE 4370

SOME NUMERICAL SOLUTIONS OF SIMILARITY EQUATIONS FOR THREE-DIMENSIONAL LAMINAR INCOMPRESSIBLE BOUNDARY-LAYER FLOWS

By Peggy L. Yohner and Arthur G. Hansen

Lewis Flight Propulsion Laboratory
Cleveland, Ohio

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SOME NUMERICAL SOLUTIONS OF SIMILARITY EQUATIONS FOR THREE-DIMENSIONAL LAMINAR INCOMPRESSIBLE BOUNDARY-LAYER FLOWS

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SUMMARY

Numerical solutions are presented for two classes of similarity equations corresponding to a range of three-dimensional boundary-layer flows. Equations for limiting-flow deflection and equations for the calculation of boundary-layer streamlines are also presented.

INTRODUCTION

Recent years have seen an increase in research activity aimed at understanding three-dimensional boundary-layer behavior. At present, basic research is continuing in both the theoretical and experimental phases of the problem. In the theoretical phase, one particular approach has been to seek exact solutions of the laminar incompressible boundary-layer equations as was done earlier for two-dimensional flows. The search for exact solutions has been based on the so-called similarity method in which the partial differential equations of the boundary layer are reduced to a two-equation system of ordinary differential equations. This research can in turn be divided into two categories. One category consists of solutions of specific problems. The other consists of general investigations for determining the circumstances under which similarity solutions exist. Research in this last category (e.g., refs. 1 to 6) has generally been carried to the point of obtaining the similarity equations but has not taken the next logical step, namely, solving the systems. In no small measure, this is a consequence of the complexity of the equations and the great variety of possible cases. Such a program is probably best accomplished by numerical analyses on high-speed computing equipment.

The value of carrying out a program for determining solutions of systems of similarity equations is twofold. First, the solutions can

give qualitative and quantitative information on boundary-layer behavior (see ref. 7). Secondly, the solutions provide a basis for developing so-called approximate methods (e.g., momentum integral techniques). In view of these considerations, certain specific systems of equations were chosen from reference 1 and analyzed on high-speed computers. The systems chosen correspond to mainstream flows which were felt to be of greatest practical interest from those given in reference 1. (A detailed discussion of the flows appears in the ANALYSIS section.) The research presented in the following sections will have three objectives:

(1) Discussion and presentation of solutions of systems of similarity equations

(2) Determination of characteristics of solutions under changes of basic flow parameters

(3) Investigation of limiting boundary-layer deflection and calculation of boundary-layer streamlines.

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ANALYSIS

The three-dimensional laminar incompressible boundary-layer equations in rectangular coordinates oriented as in figure 1 are

$$u \frac{\partial u}{\partial x} + v \frac{\partial u}{\partial y} + w \frac{\partial u}{\partial z} - \nu \frac{\partial^2 u}{\partial y^2} = U \frac{\partial U}{\partial x} + W \frac{\partial U}{\partial z} \tag{1a}$$

$$u \frac{\partial w}{\partial x} + v \frac{\partial w}{\partial y} + w \frac{\partial w}{\partial z} - \nu \frac{\partial^2 w}{\partial y^2} = U \frac{\partial W}{\partial x} + W \frac{\partial W}{\partial z} \tag{1b}$$

$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} + \frac{\partial w}{\partial z} = 0 \tag{1c}$$

(All symbols are defined in the appendix.) The boundary conditions are

$$u = v = w = 0 \quad \text{for} \quad y = 0$$

$$\lim_{y \to \infty} u = U \qquad \lim_{y \to \infty} w = W$$

As explained in reference 4, the previous equations can be reduced to ordinary differential equations in terms of functions of a similarity parameter η under the transformation

$$\frac{u}{U} = F'(\eta) \tag{2a}$$

$$\frac{w}{W} = G'(\eta) \tag{2b}$$

$$v = \frac{-\sqrt{\nu}}{g}\left[\left(\frac{\partial U}{\partial x} - U\frac{\partial \ln g}{\partial x}\right)F + \left(\frac{\partial W}{\partial z} - W\frac{\partial \ln g}{\partial z}\right)G + U\frac{\partial \ln g}{\partial x}\eta F' + W\frac{\partial \ln g}{\partial z}\eta G'\right] \tag{2c}$$

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where

$$\eta = \frac{y}{\sqrt{\nu}}\,g(x,z)$$

and where U, W, and $g(x,z)$ are defined by the four possible basic sets of values shown as follows (refs. 1 and 4):

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Case I:

$$U = ax^n$$

$$W = bx^m$$

$$g = \sqrt{\frac{cU}{x}}$$

Case II:

$$U = ax^n z^{m-1}$$

$$W = bx^{n-1}z^m$$

$$g = \sqrt{\frac{cU}{x}}$$

Case III:

$$U = ae^{nx}z^{m-1}$$

$$W = be^{nx}z^m$$

$$g = \sqrt{cU}$$

Case IV:

$$U = ae^{nx}$$

$$W = be^{mx}$$

$$g = \sqrt{cU}$$

As explained in reference 4, the flows defined by Cases I to IV are restricted to take place over developable surfaces. (It is well known, however, that eqs. (1) apply only in regions where the principal curvatures of the surface are less than the corresponding boundary-layer thickness.) The coordinates x and z are then considered as a system of orthogonal coordinates embedded in the surface, which, furthermore, are geodesics of the surface. (If the surface is a plane, the coordinate system is the usual rectangular system.)

In each of the four cases, the equations of the main-flow streamlines in the vicinity of the surface can be determined from 5218

$$\frac{dz}{dx} = \frac{W}{U} \tag{3}$$

The equations for main-flow streamlines are therefore:

Case I:

$$\left.\begin{aligned} z &= \frac{b}{a}\frac{x^{m-n+1}}{(m-n+1)} + \text{const.} \quad \text{for} \quad m \neq n-1 \\ z &= \frac{b}{a}\ln x + \text{const.} \quad \text{for} \quad m = n-1 \end{aligned}\right\} \tag{4a}$$

Case II:

$$z = (\text{const.})x^{b/a} \tag{4b}$$

Case III:

$$z = (\text{const.})e^{(b/a)x} \tag{4c}$$

Case IV:

$$z = \frac{b}{a(m-n)}e^{(m-n)x} + \text{const.} \tag{4d}$$

Of these four cases, I and II were chosen for further analysis. Limited time and effort necessitated choosing only certain classes of problems, and it was felt that I and II corresponded to flows of greatest practical importance. One reason for this choice is that it is possible to define mainstream flows with pressure gradients which either give rise to boundary layers starting from a leading edge or from a stagnation line or point. In Cases III and IV this is not possible. (A discussion of this problem is given on p. 10 of ref. 1.)

The ordinary differential equations resulting from substitution of equations (2) into equations (1) are as follows for Cases I and II:

Case I:

$$n\left(F'^2 - 1\right) - \frac{n+1}{2} FF'' - F''' = 0 \tag{5a}$$

$$m(F'G' - 1) - \frac{n+1}{2} G''F - G''' = 0 \tag{5b}$$

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where $c = 1$ in expression for g.

Case II:

$$n\left(F'^2 - 1\right) - \frac{n+1}{2} FF'' + p(m-1)(G'F' - 1) - \frac{p(m+1)}{2} GF'' - F''' = 0 \tag{6a}$$

$$pm\left(G'^2 - 1\right) - \frac{p(m+1)}{2} GG'' + (n-1)(F'G' - 1) - \frac{n+1}{2} G''F - G''' = 0 \tag{6b}$$

where $p = b/a$ and $c = 1$.

The boundary conditions for both cases are

$$F(0) = F'(0) = G(0) = G'(0) = 0$$

$$\lim_{\eta\to\infty} F'(\eta) = 1, \quad \lim_{\eta\to\infty} G'(\eta) = 1$$

CALCULATIONS OF SOLUTIONS

A method is presented for the numerical solution of the preceding equations. The calculations were done on the IBM 650 Magnetic Drum Data Processing Machine with a 653 High-Speed Storage Unit, Indexing Accumulators, and Floating Point Arithmetic. All calculations used single precision arithmetic, that is, eight significant figures.

In order to avoid large truncation errors introduced in the first term of each of the equations to be solved, the following changes in variable were introduced:

Let

$$\varphi(\eta) = F(\eta) - \eta \text{ and } \psi(\eta) = G(\eta) - \eta$$

then

$$\varphi'(\eta) = F'(\eta) - 1 \qquad \psi'(\eta) = G'(\eta) - 1$$

$$\varphi''(\eta) = F''(\eta) \qquad \psi''(\eta) = G''(\eta)$$

and

$$\varphi'''(\eta) = F'''(\eta) \qquad \psi'''(\eta) = G'''(\eta)$$

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The equations to be solved then become:

Case I:

$$n(\varphi'^2 + 2\varphi') - \left(\frac{n+1}{2}\right)(\varphi\varphi'' + \varphi''\eta) - \varphi''' = 0 \tag{7a}$$

$$m(\varphi'\psi' + \varphi' + \psi') - \left(\frac{n+1}{2}\right)(\varphi\psi'' + \psi''\eta) - \psi''' = 0 \tag{7b}$$

Case II:

$$n(\varphi'^2 + 2\varphi') - \frac{n+1}{2}(\varphi\varphi'' + \varphi''\eta) + p(m-1)(\varphi'\psi' + \varphi' + \psi') - \frac{p(m+1)}{2}(\psi\varphi'' + \varphi''\eta) - \varphi''' = 0 \tag{8a}$$

$$pm(\psi'^2 + 2\psi') - \frac{p(m+1)}{2}(\psi\psi'' + \psi''\eta) + (n-1)(\varphi'\psi' + \varphi' + \psi') - \frac{n+1}{2}(\psi''\varphi + \psi''\eta) - \psi''' = 0 \tag{8b}$$

The following boundary conditions hold for both equations:

$$\varphi(0) = 0$$

$$\varphi'(0) = -1.0$$

$$\lim_{\eta\to\infty} \varphi'(\eta) = 0$$

$$\psi(0) = 0$$

$$\psi'(0) = -1.0$$

$$\lim_{\eta\to\infty} \psi'(\eta) = 0$$

Each third-order equation was treated as a set of three simultaneous first-order equations, and the integration was done using the Runge-Kutta method with fourth-order accuracy. For example, equations (7a) and (7b) for Case I were rewritten in the following manner:

Let

$$\varphi' = P \tag{9a}$$

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$$\psi' = R \tag{9b}$$

and

$$P' = Q = \varphi'' \tag{9c}$$

$$R' = S = \psi'' \tag{9d}$$

Substituting equations (9a), (9b), (9c), and (9d) into (7a) and (7b) gives

$$Q' = n(P^2 + 2P) - \frac{n+1}{2}(\varphi Q + Q\eta) \tag{9e}$$

$$S' = m(PR + P + R) - \frac{n+1}{2}(\varphi S + S\eta) \tag{9f}$$

The previous set of six simultaneous first-order differential equations (eqs. (9)) for Case I was programmed for numerical solution. Case II was treated in a similar manner.

The approach used to find the solutions to the equations was to assume values for $F''(0)$ and $G''(0)$, hereinafter called eigenvalues, and integrate the equations numerically to a finite set value of η, labeled "∞". For purposes of computational brevity ∞ was defined as that value of η (to the next largest whole number) at which $F'(\eta) = 1.0 \pm 0.000005$ and $F''(\eta) = 0.0 \pm 0.000005$. The trial eigenvalues were then adjusted, and the process was repeated until the boundary conditions were satisfied. The step-size control was external. The step size was set such that there was no significant change in the eigenvalues when the example was rerun with a step size equal to one-half of the original value.

The results of the numerical solutions for Case I are tabulated in table I. Each part of this table contains the values of η, $G(\eta)$, $G'(\eta)$, and $G''(\eta)$ which satisfy the boundary conditions for given values of m and n. Examination of equations (5a) and (5b) shows that when $m = n$ then $F \equiv G$; therefore, there are no tabulations of $F(\eta)$ and its derivatives for the Case I solutions. They are available from the G tables for which m and n are equal.

In Case II, a similar condition exists. Examination of equations (6a) and (6b) reveals that $F \equiv G$ when $p = 1$. In addition to this, when $p = 1$, the solutions are not dependent on m and n but are dependent only on $m + n$. Tables II(1) to (8) contain the results for Case II when $p = 1$, tabulated in a similar manner to Case I, with $m + n$ as the parameter.

The solutions for Case II for $p = 2$ are presented in tables II(9) to (22). Here the results are presented in two parts. Part (a) in each table contains the values of η, $F(\eta)$, $F'(\eta)$, and $F''(\eta)$; whereas part (b) contains the values of η, $G(\eta)$, $G'(\eta)$, and $G''(\eta)$. 5218

In all the aforementioned tables, the results are presented to three-decimal-place accuracy. However, in most solutions, the eigenvalues had to be determined to the full eight-significant-figure precision in order to match the required boundary conditions. Table III lists the accurate eigenvalues for all cases as well as the values for the ratio $G''(0)/F''(0)$. In addition, table III contains an index to the preceding tables indicating the correspondence between the values of the parameters m, n, and p and the table number in which the solution is presented.

GENERAL PROPERTIES OF SOLUTIONS

Examination of figures 2 to 4 discloses trends in the graphed solutions as the parameters n, m, and p vary. In this section, an attempt will be made to analyze these trends and ascertain general properties of the solutions.

Solutions for Case I

Examination of equation (4a) indicates that the solutions for Case I apply to differing types of main-flow streamlines depending on the relation between m and n. When $m = n$, the main-flow streamline is linear; when $m = n - 1$, the streamline is logarithmic; when $m = n - d$, $d > 1$, the equation of the streamline takes the form $z = -\frac{1}{(d - 1)x^{d-1}}$; and, finally, when $m = n + d$, $d > -1$, the equation of the streamline takes the form $z = x^{d+1}/(d + 1)$. In order to illustrate the previous variation, curves were plotted from equation (4a) for $b/a = 1$. These streamlines are shown in figure 5. Examination of figures 2 (e.g., fig. 2(b)) and 5 shows that certain features of the F' and G' variations with m and n can be related to the streamline configurations. When $m < n - 1$, the streamline shape is that of a negative-reciprocal-power curve while $G'(\eta) < F'(\eta) \leq 1.0$. When $m = n - 1$, the streamline shape is logarithmic and $\underset{m<n-1}{G'(\eta)} < \underset{m=n-1}{G'(\eta)} < F'(\eta) \leq 1.0$. When $m = n$, the

streamline shape is linear while $G'(\eta) = F'(\eta) \leq 1.0$. Finally, when $m > n$, the shapes of the streamlines are power curves, $G'(\eta) > F'(\eta)$, and $G'(\eta)$ does exceed 1.0.

Studies of approximate solutions made of Case I in reference 5 indicated that the curves of the solutions should fall in certain well-determined regions in the plane. However, the form of the equations examined was not the same as that given in equations (5a) and (5b). The form was altered by a transformation of the variable η given by

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$$\eta^* = \sqrt{\frac{n+1}{2}}\,\eta \tag{10}$$

With this transformation, equations (5a) and (5b) become

$$\frac{2n}{n+1}\left(F'^2 - 1\right) - FF'' - F''' = 0 \tag{11a}$$

$$\frac{2m}{n+1}\left(F'G' - 1\right) - FG'' - G''' = 0 \tag{11b}$$

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where the primes now indicate differentiation with respect to η^*. First, it is observed that as $n \to \infty$ equations (11a) and (11b) might be approximated by

$$2\left(F_\infty'^2 - 1\right) - F_\infty F_\infty'' - F_\infty''' = 0 \tag{12a}$$

$$F_\infty G_\infty'' + G_\infty''' = 0 \tag{12b}$$

The solution for F_∞' from equation (12a) is plotted in figure 6. The solution for G_∞' from equation (12b) is given by

$$G_\infty' = c\int_0^{\eta^*} e^{-\int_0^{\eta^*} F_\infty(\eta^*)d\eta^*}\,d\eta^* \tag{13}$$

where the constant c is chosen to fulfill the boundary condition

$$\lim_{\eta\to\infty} G_\infty' = 1$$

The solution for G_∞' from equation (13) can be obtained by quadratures and is also shown in figure 6.

It is conjectured in reference 5 that the curves F_∞' and G_∞' divide the plane into three regions such that the curves for $G'(\eta^*)$ can

be characterized as always falling in a specific region for a range of values of n and m. This conjecture was examined more closely by plotting $G'(\eta^*)$ for $n = 0$, 4, and 10. The results are shown in figure 5. The region to the left of F'_∞ is designated by A, the region between F'_∞ and G'_∞ by B, and the region to right of G'_∞ by C.

If $m = 0$ in equation (11b), the result is $F_n G''_{n,0} + G'''_{n,0} = 0$, which is the same form as equation (12b). It might be expected, therefore, that the solutions for $G'_{n,0}$ should be related to the $G'_{\infty,m}$ curve. This relation is illustrated in figure 6. For $m = 0$, the G' curves lie in region C and approach the $G'_{\infty,m}$ curve as n increases. For $n > 1$ the main-flow streamlines are the negative-reciprocal-power type (fig. 5). 5218

When $m > 0$, the $G'_{m,n}$ curves have a relation to the F'_∞ curve in the following manner. The $G'_{m,n}$ curves are nearest to the F'_∞ curve (in fig. 6) whenever $m = n \neq 0$. This result is reasonable since $F' = G'$ when $m = n$. However, when $m > n$, the $G'_{m,n}$ curves are found in region A, and the main-flow streamlines are the integral-power type in figure 5. When $m \leq n$, the $G'_{m,n}$ curves are located in region B, and the main-flow streamlines are the linear-, logarithmic-, or negative-reciprocal-power curve in figure 5.

Solutions for Case II

Examination of the curves of Case II (figs. 3 and 4) reveals the following general trends in the solutions. In all solutions computed, all values of F' and G' lie below 1.0 in contrast to the solutions found for Case I. For $p = 1$, $F' = G'$, and the curves shift to the left for increasing values of $n + m$ (fig. 3). For $p = 2$, the curves for F' and G' have roughly the same shape. The curves for G' lie slightly to the left of the corresponding F' curves with the increment between the two curves decreasing as either m or n increases (fig. 4). The curves shift to the left with increasing values of m or n, however, the variation is less sensitive to n than m. It should be noted that the shape of the main-flow streamlines when $p = 1$ is linear, and, when $p = 2$, the shape is parabolic.

DETERMINATION OF LIMITING-FLOW DEFLECTION AND BOUNDARY-LAYER STREAMLINES

By knowing the solutions from previous sections it is a simple matter to calculate the limiting-flow deflection of the boundary layer on the

surface and also the actual boundary-layer streamlines for a given flow. Derivation of appropriate equations and various numerical calculations are given as follows.

Limiting-Flow Deflection of Boundary Layer

The limiting-flow deflection angle α of the boundary layer is defined by

$$\tan \alpha = \lim_{y \to 0} \frac{w}{u} = \lim_{\eta \to 0} \frac{W}{U} \frac{G'(\eta)}{F'(\eta)} \tag{14}$$

As $G'(0) = F'(0) = 0$, evaluation of $\tan \alpha$ requires the application of L'Hospital's rule. The result is

$$\tan \alpha = \frac{W}{U} \frac{G''(0)}{F''(0)} \tag{15}$$

Values of $G''(0)/F''(0)$ for the range of parameters used in the solution of Cases I and II are given in table III. In Case II it follows at once for $p = 1$ that $G''(0)/F''(0) = 1$ as the F' and G' curves coincide.

The large number of values of $G''(0)/F''(0)$ makes it desirable to study the variations of these values with changes in a given parameter. Consequently, the various values of $G''(0)/F''(0)$ for Case I are plotted against m in figure 7(a). The curves in the log-log coordinate system depicted are plotted for values of n ranging from 0 to 10. (The value for $m = 0$ is, of course, omitted.) It is seen that the curves are generally quite flat, and, in the case of $n = 0$, the curve approximates closely a straight-line variation. Furthermore, the portion of the curve from $m = 6$ on becomes quite linear in all cases. It is interesting to note that, for increasing n, the slopes of the curves at $m = 10$ apparently approach a relatively constant limiting direction.

The curves for Case II, $p = 2$, are shown in figure 7(b). There are striking differences between the two figures. In figure 7(b), the range of values for $G''(0)/F''(0)$ is very small compared with figure 7(a). Also, for $n = 0$, the curve is extremely nonlinear, with linearity being approached as n increases. As either m or n increase, the ratio of the eigenvalues approaches 1.0, and the curves approach zero slope.

The "limiting streamline" at the wall can be calculated from the differential equation:

$$\frac{dz}{dx} = \tan \alpha = \frac{G''(0)}{F''(0)} \frac{W}{U} \tag{16}$$

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It follows that the limiting streamlines for Cases I and II are:

Case I:

$$z = \frac{G''(0)}{F'''(0)} \frac{b}{a} \frac{x^{m-n+1}}{(m - n + 1)} + \text{const.} \tag{17}$$

Case II:

$$z = \text{const.} \frac{G''(0)}{F'''(0)} x^{b/a} \tag{18}$$

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Numerical Calculation of Limiting Streamlines

As an illustration of the calculation of limiting streamlines, the following specific example is considered.

From Case I, choose

$$m - n + 1 = 3$$

$$\frac{b}{a(m - n + 1)} = 1$$

and calculate limiting streamlines for the pairs of values

$$\begin{array}{lllll} n = 0, & n = 2, & n = 4, & n = 6, & n = 8 \\ m = 2, & m = 4, & m = 6, & m = 8, & m = 10 \end{array}$$

The equation for the main-flow streamline is seen to be

$$z = x^3$$

A plot of the various limiting streamlines is given in figure 8.

It might be well at this point to examine the physical implications of the results given in figure 8. To this end, consider the mainstream velocity defined by

$$\text{Velocity} = \sqrt{U^2 + W^2} = ax^n\sqrt{1 + 9x^4}$$

It is seen that, for $x \leq 1$, the higher the values of n, the smaller the velocity. Now, near $x = 0$, the boundary layer feels an acceleration normal to the main-flow streamline which is proportional to velocity$^2/r$ where r is the radius of curvature of the streamline. One would expect, therefore, that greater overturning of the boundary layer would occur initially for the smaller values of n (i.e., higher velocities). Once the boundary layer has initially turned, the influence of

the resultant mainstream pressure gradient on further turning is generally decreased as the boundary-layer direction approaches more closely the direction of the pressure gradient. These facts are evident in figure 8. It should also be noted that, for the particular case $n = 0$, velocity $\neq 0$ at $x = 0$, and, as a result, this case corresponds to a different type of physical situation than that of the other curves shown in figure 8.

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Boundary-Layer Streamlines

The equation of the boundary-layer streamlines for a given flow can be obtained parametrically by separately determining the projection of streamlines in the x,y plane and the z,x plane. The calculation of the boundary-layer streamlines for Case I will initially be considered.

The projection of the streamlines in the x,y plane can be found from the differential equation $dy/dx = v/u$. Employing equations (2a) and (2c) in this equation gives

$$\frac{dy}{dx} = \frac{v}{u} = \frac{-\sqrt{\nu}}{UF'(\eta)g}\left[\left(\frac{\partial U}{\partial x} - U\frac{\partial \ln g}{\partial x}\right)F + \left(\frac{\partial W}{\partial z} - W\frac{\partial \ln g}{\partial z}\right)G + U\frac{\partial \ln g}{\partial x}\eta F' + W\frac{\partial \ln g}{\partial z}\eta G'\right] \tag{19}$$

For Case I, this becomes

$$\frac{dy}{dx} = -\frac{1}{2x}\sqrt{\frac{\nu x}{cU}}\frac{1}{F'}\left[(n+1)F + (n-1)\eta F'\right] \tag{20}$$

Along a streamline, y can be considered a function of x; hence, $\eta = y\sqrt{\frac{cU}{\nu x}}$ can be considered a function of x. By differentiating η with respect to x and employing equation (20), the following equation can be obtained:

$$\frac{dx}{x} = \frac{-2}{n+1}\frac{\partial \ln F}{\partial \eta}$$

Integration of this equation then yields

$$x = \frac{K}{F^{2/(n+1)}} \tag{21}$$

By specifying the initial values x_0 and η_0, $F(\eta_0)$ can be calculated for a given n, and the value of the constant stream function K can be calculated. For this value of K, $F(\eta)$ and, hence, η (and $G'(\eta)$) can be obtained from the tables for all values of x along the streamline.

With a correspondence established between x and η for all points along the streamline, y can be computed from $y = \eta\sqrt{\frac{\nu x}{cU}}$. The projection of the streamline in the x,y plane is thereby obtained.

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The projection of the boundary-layer streamline in the x,z plane can be obtained from

$$\frac{dz}{dx} = \frac{w}{u} = \frac{WG'}{UF'} = \frac{bx^{m-n}}{a}\frac{G'}{F'} \tag{22}$$

With a correspondence established between x and η along a streamline by equation (21), the right side of equation (22) is determined as a function of x alone. Hence, integration of equation (22) gives

$$z = \frac{b}{a}\int_{x_0}^{x} x^{m-n}\frac{G'(\eta)}{F'(\eta)}\,dx + z_0 \tag{23}$$

On the other hand, if the expression for x given by equation (21) is substituted into equation (23), there is obtained

$$z = \frac{-2K^{m-n+1}}{n+1}\frac{b}{a}\int_{\eta_0}^{\eta}\frac{G'}{F^{\frac{2m-n+3}{n+1}}}\,d\eta + z_0 \tag{24}$$

Equations (21) and (24) can then be considered as parametric equations for the projection of the boundary-layer streamline in the x,z plane with η as the parameter.

An example of the use of equations of the previous type can be found in reference 7.

For Case II a slightly differing procedure is required inasmuch as z now enters as a variable in the expression for η and it is not possible to solve for x directly. However, the three relations, $\frac{dy}{dx} = f(x,z,\eta)$, $\frac{dz}{dx} = f(x,z,\eta)$, and $\eta = f(x,y,z)$, can be solved simultaneously for the calculation of the streamlines. The result is given as follows where η serves as a parameter:

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$$x = x_0 \, e^{-2\int_{\eta_0}^{\eta} \frac{F' \, d\eta}{(n+1)F+(m+1)\frac{b}{a}G}} \tag{25}$$

$$z = z_0 \, e^{-2\frac{b}{a}\int_{\eta_0}^{\eta} \frac{G' \, d\eta}{(n+1)F+\frac{b}{a}(m+1)G}} \tag{26}$$

$$y = y_0 \, e^{\int_{\eta_0}^{\eta} \left[\frac{1}{\eta}+\frac{(n-1)F'+\frac{b}{a}(m-1)G'}{(n+1)F+\frac{b}{a}(m+1)G}\right] d\eta} \tag{27}$$

where

$$\eta_0 = y_0\sqrt{\frac{a x_0^{n-1}}{b\nu} \, z_0^{m-1}}$$

CONCLUDING REMARKS

A number of solutions for two classes of similarity equations have been presented. The similarity equations were obtained from boundary-layer equations referred to rectangular coordinates. The main-flow streamlines for one class of flows (Case I) are curves on which corresponding points on any two streamlines are related by a constant displacement along one of the coordinate axes (a system of translates). The streamlines for the other set (Case II) are lines emanating from a point. The first class of flows might be used to analyze flows qualitatively which give rise to boundary layers originating near a leading edge or stagnation line. The second class of flows would probably find application in investigation of boundary layers originating near a point (e.g., stagnation-point flow).

The computed solutions for the first class of flows indicate that curves of the similarity function $G'(\eta)$ be in one of the three regions in the plane depending upon a choice of parameters. These parameters are exponents appearing in expressions for main-flow velocity components and, consequently, in the expression for main-flow streamlines. Sample curves of main-flow streamlines are shown that indicate the varying types of flows for which these solutions are applicable.

Equations are presented for the limiting streamlines. A numerical example is given for a flow of Case I type, and several limiting streamlines are plotted.

Finally, an analysis gives the parametric equations for calculation of streamlines in the boundary for both Case I and Case II.

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Cleveland, Ohio, September 11, 1958

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APPENDIX - SYMBOLS

a,b,c,d	constants
$F,F(\eta)$	function of similarity parameter, $u \equiv UF'(\eta)$
F_∞	particular function of η, eqs. (12)
$G,G(\eta)$	function of similarity parameter, $w = WG'(\eta)$
G_∞	particular function of η, eqs. (12)
$g,g(x,z)$	function of coordinates x and z, $g = \eta\sqrt{\nu}/y$
K	constant of integration for stream equation in x,y plane
m,n,p	constants
P,R	symbols for φ' and ψ', respectively
Q,S	symbols for P' and R', respectively
U,W	mainstream velocity components in x- and z-directions, respectively
u,v,w	boundary-layer velocity components in x-, y-, and z-directions, respectively
x,y,z	rectangular coordinates
α	limiting-flow deflection angle
η	similarity (space) variable, $\eta \equiv \frac{y}{\sqrt{\nu}} g(x,z)$
η^*	similarity variable, $\eta^* = \sqrt{\frac{n+1}{2}}\,\eta$
ν	coefficient of kinematic viscosity
φ	function of η, $\varphi = F(\eta) - \eta$
ψ	function of η, $\psi = G(\eta) - \eta$

Subscript:

0	constant

Superscripts:

Primes denote differentiation

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4. Hansen, Arthur G.: On Possible Similarity Solutions for Three-Dimensional Incompressible Laminar Boundary-Layer Flows over Developable Surfaces and with Proportional Mainstream Velocity Components. NACA TM 1437, 1958.

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6. Geis, Theo: "Ähnliche" dreidimensionale Grenzschichten. Jour. Rational Mech. Anal., vol. 5, no. 4, 1956.

7. Hansen, Arthur G., and Herzig, Howard Z.: Cross Flows in Laminar Incompressible Boundary Layers. NACA TN 3651, 1956.

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CJ-3 back

TABLE I. - NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(1) $n = 0$ and $m = 0$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	0.332	2.500	0.996	0.751	0.217	5.000	3.283	0.992	0.016
.050	.000	.017	.332	2.550	1.034	.762	.212	5.050	3.333	.992	.015
.100	.002	.033	.332	2.600	1.073	.772	.206	5.100	3.383	.993	.013
.150	.004	.050	.332	2.650	1.111	.783	.201	5.150	3.432	.994	.012
.200	.007	.066	.332	2.700	1.151	.793	.195	5.200	3.482	.994	.011
.250	.010	.083	.332	2.750	1.191	.802	.190	5.250	3.532	.995	.010
.300	.015	.100	.332	2.800	1.231	.812	.184	5.300	3.581	.995	.010
.350	.020	.116	.332	2.850	1.272	.821	.178	5.350	3.631	.996	.009
.400	.027	.133	.331	2.900	1.313	.829	.173	5.400	3.681	.996	.008
.450	.034	.149	.331	2.950	1.355	.838	.167	5.450	3.731	.997	.007
.500	.041	.166	.331	3.000	1.397	.846	.161	5.500	3.781	.997	.007
.550	.050	.182	.331	3.050	1.439	.854	.156	5.550	3.830	.997	.006
.600	.060	.199	.330	3.100	1.482	.862	.150	5.600	3.880	.997	.005
.650	.070	.215	.330	3.150	1.525	.869	.145	5.650	3.930	.998	.005
.700	.081	.232	.329	3.200	1.569	.876	.139	5.700	3.980	.998	.004
.750	.093	.248	.328	3.250	1.613	.883	.134	5.750	4.030	.998	.004
.800	.106	.265	.327	3.300	1.657	.889	.128	5.800	4.080	.998	.004
.850	.120	.281	.326	3.350	1.702	.896	.123	5.850	4.130	.999	.003
.900	.134	.297	.325	3.400	1.747	.902	.118	5.900	4.180	.999	.003
.950	.149	.314	.324	3.450	1.792	.908	.113	5.950	4.230	.999	.003
1.000	.166	.330	.323	3.500	1.838	.913	.108	6.000	4.280	.999	.002
1.050	.182	.346	.322	3.550	1.883	.918	.103	6.050	4.330	.999	.002
1.100	.200	.362	.320	3.600	1.930	.923	.098	6.100	4.380	.999	.002
1.150	.219	.378	.318	3.650	1.976	.928	.093	6.150	4.429	.999	.002
1.200	.238	.394	.317	3.700	2.022	.933	.089	6.200	4.479	.999	.002
1.250	.258	.410	.315	3.750	2.069	.937	.084	6.250	4.529	.999	.001
1.300	.279	.425	.313	3.800	2.116	.941	.080	6.300	4.579	1.000	.001
1.350	.301	.441	.310	3.850	2.163	.945	.076	6.350	4.629	1.000	.001
1.400	.323	.456	.308	3.900	2.211	.949	.072	6.400	4.679	1.000	.001
1.450	.346	.472	.305	3.950	2.258	.952	.068	6.450	4.729	1.000	.001
1.500	.370	.487	.303	4.000	2.306	.956	.064	6.500	4.779	1.000	.001
1.550	.395	.502	.300	4.050	2.354	.959	.061	6.550	4.829	1.000	.001
1.600	.420	.517	.297	4.100	2.402	.962	.057	6.600	4.879	1.000	.001
1.650	.447	.532	.293	4.150	2.450	.964	.054	6.650	4.929	1.000	.001
1.700	.473	.546	.290	4.200	2.498	.967	.051	6.700	4.979	1.000	.000
1.750	.501	.561	.287	4.250	2.546	.969	.047	6.750	5.029	1.000	.000
1.800	.530	.575	.283	4.300	2.595	.972	.044	6.800	5.079	1.000	.000
1.850	.559	.589	.279	4.350	2.644	.974	.042	6.850	5.129	1.000	.000
1.900	.588	.603	.275	4.400	2.692	.976	.039	6.900	5.179	1.000	.000
1.950	.619	.616	.271	4.450	2.741	.978	.036	6.950	5.229	1.000	.000
2.000	.650	.630	.267	4.500	2.790	.980	.034	7.000	5.279	1.000	.000
2.050	.682	.643	.262	4.550	2.839	.981	.032				
2.100	.714	.656	.258	4.600	2.888	.983	.029				
2.150	.747	.669	.253	4.650	2.937	.984	.027				
2.200	.781	.681	.248	4.700	2.987	.985	.025				
2.250	.816	.694	.243	4.750	3.036	.987	.024				
2.300	.851	.706	.238	4.800	3.085	.988	.022				
2.350	.886	.717	.233	4.850	3.135	.989	.020				
2.400	.922	.729	.228	4.900	3.184	.990	.019				
2.450	.959	.740	.223	4.950	3.234	.991	.017				

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TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(2) $n = 0$ and $m = 1$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.418	2.500	2.229	1.154	-0.070	5.000	4.887	1.008	-0.014
.050	.002	.070	1.368	2.550	2.287	1.151	-.075	5.050	4.937	1.007	-.013
.100	.007	.137	1.318	2.600	2.344	1.147	-.079	5.100	4.987	1.006	-.012
.150	.015	.201	1.268	2.650	2.401	1.143	-.082	5.150	5.038	1.006	-.011
.200	.027	.264	1.219	2.700	2.458	1.139	-.085	5.200	5.088	1.005	-.010
.250	.042	.323	1.170	2.750	2.515	1.134	-.087	5.250	5.138	1.005	-.009
.300	.059	.381	1.121	2.800	2.572	1.130	-.089	5.300	5.188	1.004	-.009
.350	.080	.435	1.073	2.850	2.628	1.126	-.090	5.350	5.239	1.004	-.008
.400	.103	.488	1.025	2.900	2.684	1.121	-.090	5.400	5.289	1.004	-.007
.450	.128	.538	.978	2.950	2.740	1.117	-.091	5.450	5.339	1.003	-.007
.500	.157	.586	.931	3.000	2.796	1.112	-.091	5.500	5.389	1.003	-.006
.550	.187	.631	.886	3.050	2.851	1.107	-.090	5.550	5.439	1.003	-.005
.600	.220	.674	.841	3.100	2.907	1.103	-.090	5.600	5.489	1.002	-.005
.650	.254	.715	.797	3.150	2.962	1.098	-.089	5.650	5.540	1.002	-.004
.700	.291	.754	.753	3.200	3.017	1.094	-.087	5.700	5.590	1.002	-.004
.750	.330	.791	.711	3.250	3.071	1.090	-.086	5.750	5.640	1.002	-.004
.800	.370	.825	.670	3.300	3.126	1.085	-.084	5.800	5.690	1.002	-.003
.850	.412	.858	.629	3.350	3.180	1.081	-.082	5.850	5.740	1.001	-.003
.900	.456	.888	.590	3.400	3.234	1.077	-.080	5.900	5.790	1.001	-.003
.950	.501	.917	.552	3.450	3.287	1.073	-.078	5.950	5.840	1.001	-.002
1.000	.548	.943	.515	3.500	3.341	1.069	-.076	6.000	5.890	1.001	-.002
1.050	.595	.968	.479	3.550	3.394	1.066	-.074	6.050	5.940	1.001	-.002
1.100	.644	.991	.444	3.600	3.448	1.062	-.071	6.100	5.990	1.001	-.002
1.150	.694	1.012	.410	3.650	3.501	1.059	-.069	6.150	6.040	1.001	-.002
1.200	.746	1.032	.378	3.700	3.553	1.055	-.066	6.200	6.090	1.001	-.001
1.250	.798	1.050	.346	3.750	3.606	1.052	-.064	6.250	6.140	1.001	-.001
1.300	.851	1.067	.316	3.800	3.659	1.049	-.061	6.300	6.190	1.000	-.001
1.350	.904	1.082	.287	3.850	3.711	1.046	-.059	6.350	6.240	1.000	-.001
1.400	.959	1.096	.260	3.900	3.763	1.043	-.056	6.400	6.290	1.000	-.001
1.450	1.014	1.108	.233	3.950	3.815	1.040	-.053	6.450	6.340	1.000	-.001
1.500	1.069	1.119	.208	4.000	3.867	1.038	-.051	6.500	6.390	1.000	-.001
1.550	1.126	1.129	.184	4.050	3.919	1.035	-.048	6.550	6.440	1.000	-.001
1.600	1.182	1.137	.161	4.100	3.971	1.033	-.046	6.600	6.490	1.000	-.001
1.650	1.239	1.145	.139	4.150	4.022	1.031	-.044	6.650	6.540	1.000	-.001
1.700	1.297	1.151	.118	4.200	4.074	1.028	-.041	6.700	6.590	1.000	.000
1.750	1.354	1.157	.099	4.250	4.125	1.026	-.039	6.750	6.640	1.000	.000
1.800	1.412	1.161	.081	4.300	4.176	1.025	-.037	6.800	6.690	1.000	.000
1.850	1.471	1.165	.064	4.350	4.228	1.023	-.035	6.850	6.740	1.000	.000
1.900	1.529	1.168	.048	4.400	4.279	1.021	-.033	6.900	6.790	1.000	.000
1.950	1.587	1.170	.033	4.450	4.330	1.019	-.031	6.950	6.840	1.000	.000
2.000	1.646	1.171	.019	4.500	4.381	1.018	-.029	7.000	6.890	1.000	.000
2.050	1.704	1.171	.006	4.550	4.431	1.017	-.027				
2.100	1.763	1.171	-.006	4.600	4.482	1.015	-.025				
2.150	1.822	1.171	-.017	4.650	4.533	1.014	-.023				
2.200	1.880	1.170	-.027	4.700	4.584	1.013	-.022				
2.250	1.938	1.168	-.036	4.750	4.634	1.012	-.020				
2.300	1.997	1.166	-.045	4.800	4.685	1.011	-.019				
2.350	2.055	1.164	-.052	4.850	4.735	1.010	-.018				
2.400	2.113	1.161	-.059	4.900	4.786	1.009	-.016				
2.450	2.171	1.158	-.065	4.950	4.836	1.008	-.015				

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TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(3) $n = 0$ and $m = 2$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	2.197	2.500	2.820	1.268	-0.210	5.000	5.553	1.009	-0.017
.050	.003	.107	2.097	2.550	2.883	1.258	-.209	5.050	5.603	1.008	-.015
.100	.011	.210	1.998	2.600	2.946	1.248	-.207	5.100	5.653	1.007	-.014
.150	.024	.307	1.898	2.650	3.008	1.237	-.205	5.150	5.704	1.007	-.013
.200	.041	.400	1.800	2.700	3.069	1.227	-.202	5.200	5.754	1.006	-.012
.250	.063	.487	1.703	2.750	3.130	1.217	-.199	5.250	5.804	1.005	-.011
.300	.090	.570	1.608	2.800	3.191	1.207	-.195	5.300	5.855	1.005	-.010
.350	.120	.648	1.514	2.850	3.251	1.198	-.191	5.350	5.905	1.004	-.009
.400	.155	.721	1.421	2.900	3.311	1.188	-.187	5.400	5.955	1.004	-.008
.450	.192	.790	1.331	2.950	3.370	1.179	-.182	5.450	6.005	1.004	-.008
.500	.234	.854	1.243	3.000	3.429	1.170	-.177	5.500	6.055	1.003	-.007
.550	.278	.914	1.157	3.050	3.487	1.161	-.171	5.550	6.106	1.003	-.006
.600	.325	.970	1.073	3.100	3.545	1.153	-.166	5.600	6.156	1.003	-.006
.650	.375	1.022	.992	3.150	3.602	1.145	-.161	5.650	6.206	1.002	-.005
.700	.427	1.069	.914	3.200	3.659	1.137	-.155	5.700	6.256	1.002	-.005
.750	.482	1.113	.838	3.250	3.716	1.129	-.149	5.750	6.306	1.002	-.004
.800	.538	1.153	.765	3.300	3.772	1.122	-.143	5.800	6.356	1.002	-.004
.850	.597	1.190	.695	3.350	3.828	1.115	-.138	5.850	6.406	1.001	-.003
.900	.657	1.223	.628	3.400	3.884	1.108	-.132	5.900	6.456	1.001	-.003
.950	.719	1.253	.564	3.450	3.939	1.102	-.126	5.950	6.506	1.001	-.003
1.000	.782	1.279	.502	3.500	3.994	1.095	-.121	6.000	6.556	1.001	-.002
1.050	.847	1.303	.444	3.550	4.048	1.090	-.115	6.050	6.606	1.001	-.002
1.100	.913	1.324	.388	3.600	4.103	1.084	-.110	6.100	6.656	1.001	-.002
1.150	.979	1.342	.336	3.650	4.157	1.079	-.104	6.150	6.707	1.001	-.002
1.200	1.047	1.357	.286	3.700	4.211	1.073	-.099	6.200	6.757	1.001	-.002
1.250	1.115	1.370	.239	3.750	4.264	1.069	-.094	6.250	6.807	1.001	-.001
1.300	1.184	1.381	.195	3.800	4.317	1.064	-.089	6.300	6.857	1.001	-.001
1.350	1.253	1.390	.154	3.850	4.371	1.060	-.084	6.350	6.907	1.000	-.001
1.400	1.323	1.397	.115	3.900	4.423	1.056	-.080	6.400	6.957	1.000	-.001
1.450	1.393	1.401	.079	3.950	4.476	1.052	-.075	6.450	7.007	1.000	-.001
1.500	1.463	1.405	.046	4.000	4.529	1.048	-.071	6.500	7.057	1.000	-.001
1.550	1.533	1.406	.015	4.050	4.581	1.045	-.067	6.550	7.107	1.000	-.001
1.600	1.603	1.406	-.013	4.100	4.633	1.041	-.063	6.600	7.157	1.000	-.001
1.650	1.674	1.405	-.039	4.150	4.685	1.038	-.059	6.650	7.207	1.000	-.001
1.700	1.744	1.402	-.063	4.200	4.737	1.035	-.055	6.700	7.257	1.000	.000
1.750	1.814	1.399	-.085	4.250	4.789	1.033	-.052	6.750	7.307	1.000	.000
1.800	1.884	1.394	-.104	4.300	4.840	1.030	-.049	6.800	7.357	1.000	.000
1.850	1.953	1.388	-.122	4.350	4.892	1.028	-.045	6.850	7.407	1.000	.000
1.900	2.023	1.382	-.137	4.400	4.943	1.026	-.042	6.900	7.457	1.000	.000
1.950	2.091	1.375	-.151	4.450	4.994	1.024	-.040	6.950	7.507	1.000	.000
2.000	2.160	1.367	-.163	4.500	5.045	1.022	-.037	7.000	7.557	1.000	.000
2.050	2.228	1.358	-.174	4.550	5.096	1.020	-.034				
2.100	2.296	1.349	-.183	4.600	5.147	1.018	-.032				
2.150	2.363	1.340	-.190	4.650	5.198	1.017	-.029				
2.200	2.430	1.330	-.196	4.700	5.249	1.015	-.027				
2.250	2.496	1.320	-.201	4.750	5.300	1.014	-.025				
2.300	2.562	1.310	-.205	4.800	5.350	1.013	-.023				
2.350	2.627	1.300	-.208	4.850	5.401	1.012	-.022				
2.400	2.692	1.289	-.209	4.900	5.452	1.011	-.020				
2.450	2.756	1.279	-.210	4.950	5.502	1.010	-.018				

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TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(4) $n = 0$ and $m = \frac{1}{4}$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	3.450	2.500	3.497	1.339	-0.339	5.000	6.263	1.009	-0.017
.050	.004	.168	3.250	2.550	3.564	1.322	-.329	5.050	6.313	1.008	-.016
.100	.017	.325	3.051	2.600	3.630	1.306	-.319	5.100	6.363	1.007	-.014
.150	.037	.473	2.855	2.650	3.694	1.290	-.309	5.150	6.414	1.007	-.013
.200	.064	.611	2.661	2.700	3.759	1.275	-.298	5.200	6.464	1.006	-.012
.250	.097	.739	2.470	2.750	3.822	1.261	-.287	5.250	6.514	1.005	-.011
.300	.137	.858	2.284	2.800	3.885	1.246	-.276	5.300	6.565	1.005	-.010
.350	.183	.967	2.103	2.850	3.947	1.233	-.266	5.350	6.615	1.004	-.009
.400	.234	1.068	1.927	2.900	4.008	1.220	-.255	5.400	6.665	1.004	-.008
.450	.290	1.160	1.757	2.950	4.069	1.207	-.244	5.450	6.715	1.004	-.008
.500	.350	1.244	1.594	3.000	4.129	1.196	-.234	5.500	6.765	1.003	-.007
.550	.414	1.320	1.437	3.050	4.188	1.184	-.223	5.550	6.816	1.003	-.006
.600	.482	1.388	1.286	3.100	4.247	1.173	-.213	5.600	6.866	1.003	-.006
.650	.553	1.448	1.143	3.150	4.306	1.163	-.203	5.650	6.916	1.002	-.005
.700	.626	1.502	1.007	3.200	4.363	1.153	-.193	5.700	6.966	1.002	-.005
.750	.703	1.549	.878	3.250	4.421	1.143	-.184	5.750	7.016	1.002	-.004
.800	.781	1.590	.757	3.300	4.478	1.134	-.175	5.800	7.066	1.002	-.004
.850	.862	1.625	.643	3.350	4.534	1.126	-.166	5.850	7.116	1.001	-.003
.900	.944	1.654	.536	3.400	4.590	1.118	-.157	5.900	7.166	1.001	-.003
.950	1.027	1.679	.436	3.450	4.646	1.110	-.149	5.950	7.216	1.001	-.003
1.000	1.111	1.698	.343	3.500	4.701	1.103	-.141	6.000	7.266	1.001	-.002
1.050	1.197	1.713	.257	3.550	4.756	1.096	-.133	6.050	7.316	1.001	-.002
1.100	1.283	1.724	.178	3.600	4.811	1.090	-.126	6.100	7.366	1.001	-.002
1.150	1.369	1.731	.105	3.650	4.865	1.084	-.119	6.150	7.417	1.001	-.002
1.200	1.456	1.735	.038	3.700	4.919	1.078	-.112	6.200	7.467	1.001	-.002
1.250	1.542	1.735	-.023	3.750	4.973	1.072	-.105	6.250	7.517	1.001	-.001
1.300	1.629	1.732	-.078	3.800	5.027	1.067	-.099	6.300	7.567	1.001	-.001
1.350	1.716	1.727	-.127	3.850	5.080	1.062	-.093	6.350	7.617	1.000	-.001
1.400	1.802	1.720	-.171	3.900	5.133	1.058	-.087	6.400	7.667	1.000	-.001
1.450	1.888	1.710	-.210	3.950	5.186	1.054	-.082	6.450	7.717	1.000	-.001
1.500	1.973	1.699	-.245	4.000	5.238	1.050	-.077	6.500	7.767	1.000	-.001
1.550	2.057	1.686	-.275	4.050	5.291	1.046	-.072	6.550	7.817	1.000	-.001
1.600	2.141	1.671	-.301	4.100	5.343	1.043	-.067	6.600	7.867	1.000	-.001
1.650	2.225	1.656	-.323	4.150	5.395	1.039	-.063	6.650	7.917	1.000	.000
1.700	2.307	1.639	-.342	4.200	5.447	1.036	-.059	6.700	7.967	1.000	.000
1.750	2.388	1.622	-.357	4.250	5.499	1.033	-.055	6.750	8.017	1.000	.000
1.800	2.469	1.603	-.370	4.300	5.550	1.031	-.051	6.800	8.067	1.000	.000
1.850	2.549	1.585	-.379	4.350	5.602	1.028	-.047	6.850	8.117	1.000	.000
1.900	2.628	1.565	-.386	4.400	5.653	1.026	-.044	6.900	8.167	1.000	.000
1.950	2.705	1.546	-.390	4.450	5.704	1.024	-.041	6.950	8.217	1.000	.000
2.000	2.782	1.526	-.393	4.500	5.755	1.022	-.038	7.000	8.267	1.000	.000
2.050	2.858	1.507	-.393	4.550	5.806	1.020	-.035				
2.100	2.933	1.487	-.392	4.600	5.857	1.018	-.033				
2.150	3.007	1.468	-.389	4.650	5.908	1.017	-.030				
2.200	3.080	1.448	-.385	4.700	5.959	1.015	-.028				
2.250	3.151	1.429	-.379	4.750	6.010	1.014	-.026				
2.300	3.222	1.410	-.373	4.800	6.060	1.013	-.024				
2.350	3.293	1.392	-.365	4.850	6.111	1.012	-.022				
2.400	3.362	1.374	-.357	4.900	6.162	1.011	-.020				
2.450	3.430	1.356	-.348	4.950	6.212	1.010	-.018				

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TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(5) n = 0 and m = 6

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	4.506	2.500	3.915	1.356	-0.391	5.000	6.684	1.009	-0.017
.050	.006	.218	4.206	2.550	3.982	1.337	-.376	5.050	6.734	1.008	-.015
.100	.022	.421	3.908	2.600	4.049	1.319	-.361	5.100	6.784	1.007	-.014
.150	.047	.609	3.615	2.650	4.114	1.301	-.345	5.150	6.835	1.006	-.013
.200	.082	.782	3.326	2.700	4.179	1.284	-.330	5.200	6.885	1.006	-.012
.250	.125	.941	3.045	2.750	4.243	1.268	-.316	5.250	6.935	1.005	-.011
.300	.176	1.087	2.772	2.800	4.306	1.253	-.301	5.300	6.986	1.005	-.010
.350	.234	1.219	2.508	2.850	4.368	1.238	-.287	5.350	7.036	1.004	-.009
.400	.298	1.338	2.255	2.900	4.429	1.224	-.274	5.400	7.086	1.004	-.008
.450	.367	1.444	2.012	2.950	4.490	1.210	-.260	5.450	7.136	1.004	-.007
.500	.442	1.539	1.781	3.000	4.550	1.198	-.247	5.500	7.186	1.003	-.007
.550	.521	1.623	1.562	3.050	4.610	1.186	-.235	5.550	7.236	1.003	-.006
.600	.604	1.696	1.355	3.100	4.669	1.174	-.223	5.600	7.287	1.003	-.006
.650	.690	1.758	1.160	3.150	4.727	1.163	-.211	5.650	7.337	1.002	-.005
.700	.780	1.812	.978	3.200	4.785	1.153	-.200	5.700	7.387	1.002	-.005
.750	.872	1.856	.808	3.250	4.843	1.143	-.190	5.750	7.437	1.002	-.004
.800	.965	1.893	.651	3.300	4.900	1.134	-.179	5.800	7.487	1.002	-.004
.850	1.061	1.922	.505	3.350	4.956	1.125	-.169	5.850	7.537	1.001	-.003
.900	1.157	1.944	.372	3.400	5.012	1.117	-.160	5.900	7.587	1.001	-.003
.950	1.254	1.959	.250	3.450	5.068	1.109	-.151	5.950	7.637	1.001	-.003
1.000	1.353	1.969	.138	3.500	5.123	1.102	-.142	6.000	7.687	1.001	-.002
1.050	1.452	1.973	.038	3.550	5.178	1.095	-.134	6.050	7.737	1.001	-.002
1.100	1.550	1.973	-.053	3.600	5.233	1.089	-.126	6.100	7.787	1.001	-.002
1.150	1.649	1.968	-.133	3.650	5.287	1.083	-.119	6.150	7.837	1.001	-.002
1.200	1.747	1.960	-.205	3.700	5.341	1.077	-.112	6.200	7.887	1.001	-.002
1.250	1.845	1.948	-.268	3.750	5.395	1.071	-.105	6.250	7.938	1.001	-.001
1.300	1.942	1.933	-.323	3.800	5.448	1.066	-.098	6.300	7.988	1.001	-.001
1.350	2.038	1.915	-.371	3.850	5.501	1.062	-.092	6.350	8.038	1.000	-.001
1.400	2.133	1.896	-.411	3.900	5.554	1.057	-.087	6.400	8.088	1.000	-.001
1.450	2.228	1.874	-.445	3.950	5.607	1.053	-.081	6.450	8.138	1.000	-.001
1.500	2.321	1.851	-.473	4.000	5.660	1.049	-.076	6.500	8.188	1.000	-.001
1.550	2.413	1.827	-.496	4.050	5.712	1.045	-.071	6.550	8.238	1.000	-.001
1.600	2.504	1.802	-.513	4.100	5.764	1.042	-.066	6.600	8.288	1.000	-.001
1.650	2.593	1.776	-.526	4.150	5.816	1.039	-.062	6.650	8.338	1.000	.000
1.700	2.681	1.749	-.535	4.200	5.868	1.036	-.058	6.700	8.388	1.000	.000
1.750	2.768	1.722	-.541	4.250	5.920	1.033	-.054	6.750	8.438	1.000	.000
1.800	2.853	1.695	-.543	4.300	5.971	1.030	-.050	6.800	8.488	1.000	.000
1.850	2.937	1.668	-.542	4.350	6.023	1.028	-.047	6.850	8.538	1.000	.000
1.900	3.020	1.641	-.538	4.400	6.074	1.026	-.043	6.900	8.588	1.000	.000
1.950	3.102	1.614	-.533	4.450	6.125	1.024	-.040	6.950	8.638	1.000	.000
2.000	3.182	1.588	-.525	4.500	6.176	1.022	-.037	7.000	8.688	1.000	.000
2.050	3.260	1.562	-.516	4.550	6.227	1.020	-.035				
2.100	3.338	1.537	-.505	4.600	6.278	1.018	-.032				
2.150	3.414	1.512	-.493	4.650	6.329	1.017	-.030				
2.200	3.489	1.487	-.480	4.700	6.380	1.015	-.027				
2.250	3.563	1.464	-.466	4.750	6.431	1.014	-.025				
2.300	3.635	1.441	-.452	4.800	6.481	1.013	-.023				
2.350	3.707	1.418	-.437	4.850	6.532	1.012	-.021				
2.400	3.777	1.397	-.422	4.900	6.583	1.011	-.020				
2.450	3.847	1.376	-.407	4.950	6.633	1.010	-.018				

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TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(6) n = 0 and m = 8

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	5.449	2.500	4.215	1.360	-0.414	5.000	6.982	1.009	-0.017
.050	.007	.262	5.050	2.550	4.282	1.340	-.395	5.050	7.033	1.008	-.015
.100	.026	.505	4.654	2.600	4.349	1.320	-.377	5.100	7.083	1.007	-.014
.150	.057	.728	4.264	2.650	4.414	1.302	-.359	5.150	7.133	1.006	-.013
.200	.098	.932	3.883	2.700	4.479	1.284	-.342	5.200	7.184	1.006	-.012
.250	.150	1.116	3.513	2.750	4.543	1.268	-.325	5.250	7.234	1.005	-.011
.300	.210	1.283	3.156	2.800	4.606	1.252	-.309	5.300	7.284	1.005	-.010
.350	.278	1.432	2.813	2.850	4.668	1.237	-.293	5.350	7.334	1.004	-.009
.400	.353	1.565	2.486	2.900	4.730	1.223	-.278	5.400	7.385	1.004	-.008
.450	.434	1.681	2.176	2.950	4.790	1.209	-.264	5.450	7.435	1.003	-.008
.500	.521	1.783	1.884	3.000	4.851	1.196	-.250	5.500	7.485	1.003	-.007
.550	.612	1.870	1.609	3.050	4.910	1.184	-.237	5.550	7.535	1.003	-.006
.600	.707	1.944	1.352	3.100	4.969	1.173	-.224	5.600	7.585	1.002	-.006
.650	.806	2.005	1.114	3.150	5.027	1.162	-.212	5.650	7.635	1.002	-.005
.700	.908	2.055	.894	3.200	5.085	1.151	-.200	5.700	7.685	1.002	-.005
.750	1.011	2.095	.692	3.250	5.142	1.142	-.189	5.750	7.735	1.002	-.005
.800	1.117	2.125	.507	3.300	5.199	1.133	-.178	5.800	7.785	1.001	-.004
.850	1.224	2.146	.339	3.350	5.256	1.124	-.168	5.850	7.836	1.001	-.004
.900	1.331	2.159	.187	3.400	5.312	1.116	-.159	5.900	7.886	1.001	-.004
.950	1.440	2.165	.051	3.450	5.367	1.108	-.150	5.950	7.936	1.001	-.003
1.000	1.548	2.164	-.070	3.500	5.423	1.101	-.141	6.000	7.986	1.001	-.003
1.050	1.656	2.158	-.178	3.550	5.477	1.094	-.133	6.050	8.036	1.001	-.003
1.100	1.764	2.147	-.272	3.600	5.532	1.087	-.125	6.100	8.086	1.000	-.002
1.150	1.871	2.131	-.354	3.650	5.586	1.081	-.117	6.150	8.136	1.000	-.002
1.200	1.977	2.112	-.424	3.700	5.640	1.076	-.110	6.200	8.186	1.000	-.002
1.250	2.082	2.089	-.484	3.750	5.694	1.070	-.103	6.250	8.236	1.000	-.002
1.300	2.185	2.064	-.533	3.800	5.747	1.065	-.097	6.300	8.286	1.000	-.001
1.350	2.288	2.036	-.574	3.850	5.800	1.061	-.091	6.350	8.336	1.000	-.001
1.400	2.389	2.006	-.607	3.900	5.853	1.056	-.085	6.400	8.386	1.000	-.001
1.450	2.489	1.975	-.633	3.950	5.906	1.052	-.080	6.450	8.436	1.000	-.001
1.500	2.587	1.943	-.651	4.000	5.958	1.048	-.075	6.500	8.486	1.000	-.001
1.550	2.683	1.910	-.664	4.050	6.011	1.045	-.070	6.550	8.536	1.000	-.001
1.600	2.778	1.877	-.672	4.100	6.063	1.041	-.065	6.600	8.586	1.000	-.001
1.650	2.871	1.843	-.674	4.150	6.115	1.038	-.061	6.650	8.636	1.000	-.001
1.700	2.962	1.809	-.673	4.200	6.167	1.035	-.057	6.700	8.686	1.000	-.001
1.750	3.051	1.776	-.668	4.250	6.218	1.033	-.053	6.750	8.735	1.000	.000
1.800	3.139	1.743	-.660	4.300	6.270	1.030	-.049	6.800	8.785	1.000	.000
1.850	3.226	1.710	-.649	4.350	6.321	1.028	-.046	6.850	8.835	1.000	.000
1.900	3.310	1.678	-.637	4.400	6.373	1.025	-.043	6.900	8.885	1.000	.000
1.950	3.394	1.646	-.622	4.450	6.424	1.023	-.040	6.950	8.935	1.000	.000
2.000	3.475	1.616	-.606	4.500	6.475	1.021	-.037	7.000	8.985	1.000	.000
2.050	3.555	1.586	-.588	4.550	6.526	1.020	-.034				
2.100	3.634	1.557	-.570	4.600	6.577	1.018	-.032				
2.150	3.711	1.529	-.551	4.650	6.628	1.016	-.029				
2.200	3.787	1.502	-.532	4.700	6.679	1.015	-.027				
2.250	3.861	1.476	-.512	4.750	6.729	1.014	-.025				
2.300	3.934	1.450	-.492	4.800	6.780	1.013	-.023				
2.350	4.006	1.426	-.472	4.850	6.831	1.012	-.021				
2.400	4.077	1.403	-.453	4.900	6.881	1.011	-.020				
2.450	4.146	1.381	-.433	4.950	6.932	1.009	-.018				

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TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(7) n = 0 and m = 10

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	6.317	2.500	4.448	1.359	-0.423	5.000	7.213	1.009	-0.016
.050	.008	.303	5.818	2.550	4.516	1.339	-.403	5.050	7.264	1.008	-.015
.100	.030	.582	5.324	2.600	4.582	1.319	-.383	5.100	7.314	1.007	-.014
.150	.065	.836	4.838	2.650	4.648	1.300	-.363	5.150	7.364	1.007	-.013
.200	.113	1.066	4.365	2.700	4.712	1.283	-.345	5.200	7.415	1.006	-.012
.250	.172	1.273	3.908	2.750	4.776	1.266	-.327	5.250	7.465	1.005	-.011
.300	.240	1.457	3.470	2.800	4.839	1.250	-.310	5.300	7.515	1.005	-.010
.350	.317	1.620	3.052	2.850	4.901	1.235	-.293	5.350	7.565	1.004	-.009
.400	.402	1.763	2.655	2.900	4.962	1.221	-.278	5.400	7.616	1.004	-.008
.450	.493	1.886	2.282	2.950	5.023	1.207	-.263	5.450	7.666	1.004	-.007
.500	.590	1.991	1.933	3.000	5.083	1.194	-.249	5.500	7.716	1.003	-.006
.550	.692	2.080	1.609	3.050	5.142	1.182	-.235	5.550	7.766	1.003	-.006
.600	.798	2.153	1.309	3.100	5.201	1.171	-.222	5.600	7.816	1.003	-.005
.650	.907	2.211	1.033	3.150	5.259	1.160	-.210	5.650	7.866	1.003	-.005
.700	1.019	2.256	.781	3.200	5.317	1.150	-.198	5.700	7.916	1.002	-.004
.750	1.132	2.289	.553	3.250	5.374	1.140	-.187	5.750	7.967	1.002	-.004
.800	1.247	2.312	.347	3.300	5.431	1.131	-.176	5.800	8.017	1.002	-.003
.850	1.363	2.325	.163	3.350	5.488	1.123	-.166	5.850	8.067	1.002	-.003
.900	1.480	2.328	-.001	3.400	5.543	1.114	-.157	5.900	8.117	1.002	-.002
.950	1.596	2.325	-.145	3.450	5.599	1.107	-.148	5.950	8.167	1.001	-.002
1.000	1.712	2.314	-.271	3.500	5.654	1.100	-.139	6.000	8.217	1.001	-.002
1.050	1.827	2.298	-.380	3.550	5.709	1.093	-.131	6.050	8.267	1.001	-.002
1.100	1.942	2.276	-.473	3.600	5.763	1.087	-.123	6.100	8.317	1.001	-.001
1.150	2.055	2.251	-.552	3.650	5.818	1.081	-.116	6.150	8.367	1.000	-.001
1.200	2.167	2.221	-.617	3.700	5.871	1.075	-.109	6.200	8.417	1.000	-.001
1.250	2.277	2.189	-.670	3.750	5.925	1.070	-.102	6.250	8.467	1.000	.000
1.300	2.386	2.155	-.712	3.800	5.978	1.065	-.096	6.300	8.517	1.000	.000
1.350	2.492	2.118	-.745	3.850	6.032	1.060	-.090	6.350	8.567	1.000	.000
1.400	2.597	2.080	-.768	3.900	6.084	1.056	-.084	6.400	8.618	1.000	.000
1.450	2.700	2.042	-.783	3.950	6.137	1.052	-.079	6.450	8.668	1.000	.000
1.500	2.802	2.002	-.792	4.000	6.190	1.048	-.074	6.500	8.718	1.000	.000
1.550	2.901	1.962	-.794	4.050	6.242	1.044	-.069	6.550	8.768	1.000	.000
1.600	2.998	1.923	-.792	4.100	6.294	1.041	-.064	6.600	8.818	1.000	.000
1.650	3.093	1.883	-.784	4.150	6.346	1.038	-.060	6.650	8.868	1.000	.000
1.700	3.186	1.844	-.773	4.200	6.398	1.035	-.056	6.700	8.918	1.000	.000
1.750	3.277	1.806	-.759	4.250	6.450	1.032	-.052	6.750	8.968	1.000	.000
1.800	3.367	1.769	-.742	4.300	6.501	1.030	-.049	6.800	9.018	1.000	.000
1.850	3.454	1.732	-.723	4.350	6.553	1.027	-.045	6.850	9.068	1.000	.000
1.900	3.540	1.696	-.702	4.400	6.604	1.025	-.042	6.900	9.118	1.000	.000
1.950	3.624	1.662	-.680	4.450	6.655	1.023	-.039	6.950	9.168	1.000	.000
2.000	3.706	1.628	-.657	4.500	6.706	1.021	-.037	7.000	9.218	1.000	.000
2.050	3.787	1.596	-.633	4.550	6.757	1.020	-.034				
2.100	3.866	1.565	-.609	4.600	6.808	1.018	-.031				
2.150	3.943	1.535	-.585	4.650	6.859	1.016	-.029				
2.200	4.019	1.506	-.561	4.700	6.910	1.015	-.027				
2.250	4.094	1.479	-.537	4.750	6.961	1.014	-.025				
2.300	4.167	1.453	-.513	4.800	7.011	1.013	-.023				
2.350	4.239	1.428	-.490	4.850	7.062	1.011	-.021				
2.400	4.310	1.404	-.467	4.900	7.112	1.010	-.019				
2.450	4.380	1.381	-.445	4.950	7.163	1.010	-.018				

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(8) $n = 1$ and $m = 0$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	0.570	2.000	1.024	0.891	0.198	4.000	2.974	1.000	0.002
.050	.001	.029	.570	2.050	1.069	.901	.184	4.050	3.024	1.000	.002
.100	.003	.057	.570	2.100	1.114	.910	.172	4.100	3.074	1.000	.001
.150	.006	.086	.570	2.150	1.160	.918	.159	4.150	3.124	1.000	.001
.200	.011	.114	.570	2.200	1.206	.926	.148	4.200	3.174	1.000	.001
.250	.018	.143	.569	2.250	1.252	.933	.136	4.250	3.224	1.000	.001
.300	.026	.171	.568	2.300	1.299	.939	.126	4.300	3.274	1.000	.001
.350	.035	.199	.566	2.350	1.346	.945	.116	4.350	3.324	1.000	.001
.400	.046	.227	.564	2.400	1.394	.951	.106	4.400	3.374	1.000	.000
.450	.058	.256	.561	2.450	1.441	.956	.097	4.450	3.424	1.000	.000
.500	.071	.284	.557	2.500	1.489	.961	.088	4.500	3.474	1.000	.000
.550	.086	.311	.553	2.550	1.537	.965	.081	4.550	3.524	1.000	.000
.600	.102	.339	.549	2.600	1.586	.969	.073	4.600	3.574	1.000	.000
.650	.120	.366	.543	2.650	1.634	.972	.066	4.650	3.624	1.000	.000
.700	.139	.393	.537	2.700	1.683	.975	.060	4.700	3.674	1.000	.000
.750	.159	.420	.530	2.750	1.732	.978	.054	4.750	3.724	1.000	.000
.800	.181	.446	.522	2.800	1.781	.981	.048	4.800	3.774	1.000	.000
.850	.204	.472	.514	2.850	1.830	.983	.043	4.850	3.824	1.000	.000
.900	.228	.498	.504	2.900	1.879	.985	.039	4.900	3.874	1.000	.000
.950	.254	.522	.494	2.950	1.928	.987	.035	4.950	3.924	1.000	.000
1.000	.280	.547	.483	3.000	1.978	.989	.031	5.000	3.974	1.000	.000
1.050	.308	.571	.472	3.050	2.027	.990	.027				
1.100	.337	.594	.460	3.100	2.077	.991	.024				
1.150	.368	.617	.447	3.150	2.126	.992	.021				
1.200	.399	.639	.434	3.200	2.176	.993	.019				
1.250	.432	.660	.420	3.250	2.226	.994	.017				
1.300	.465	.681	.406	3.300	2.275	.995	.015				
1.350	.500	.701	.392	3.350	2.325	.996	.013				
1.400	.535	.720	.377	3.400	2.375	.996	.011				
1.450	.572	.738	.362	3.450	2.425	.997	.010				
1.500	.609	.756	.346	3.500	2.475	.997	.008				
1.550	.647	.773	.331	3.550	2.524	.998	.007				
1.600	.686	.789	.315	3.600	2.574	.998	.006				
1.650	.726	.805	.300	3.650	2.624	.998	.005				
1.700	.767	.819	.285	3.700	2.674	.999	.005				
1.750	.808	.833	.269	3.750	2.724	.999	.004				
1.800	.850	.846	.254	3.800	2.774	.999	.003				
1.850	.893	.859	.240	3.850	2.824	.999	.003				
1.900	.936	.870	.225	3.900	2.874	.999	.002				
1.950	.980	.881	.211	3.950	2.924	.999	.002				

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(9) $n = 1$ and $m = 1$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.233	2.000	1.362	0.973	0.066
.050	.002	.060	1.183	2.050	1.411	.976	.059
.100	.006	.118	1.133	2.100	1.460	.979	.053
.150	.013	.174	1.083	2.150	1.509	.982	.047
.200	.023	.227	1.034	2.200	1.558	.984	.042
.250	.036	.277	.986	2.250	1.607	.986	.037
.300	.051	.325	.939	2.300	1.656	.988	.033
.350	.068	.371	.892	2.350	1.706	.989	.029
.400	.088	.414	.846	2.400	1.755	.991	.026
.450	.110	.456	.802	2.450	1.805	.992	.023
.500	.134	.495	.758	2.500	1.854	.993	.020
.550	.159	.532	.716	2.550	1.904	.994	.018
.600	.187	.566	.675	2.600	1.954	.995	.016
.650	.216	.599	.636	2.650	2.004	.995	.014
.700	.247	.630	.597	2.700	2.053	.996	.012
.750	.279	.659	.561	2.750	2.103	.997	.010
.800	.312	.686	.525	2.800	2.153	.997	.009
.850	.347	.711	.491	2.850	2.203	.997	.008
.900	.384	.735	.459	2.900	2.253	.998	.007
.950	.421	.757	.428	2.950	2.303	.998	.006
1.000	.459	.778	.398	3.000	2.353	.998	.005
1.050	.499	.797	.370	3.050	2.402	.999	.004
1.100	.539	.815	.343	3.100	2.452	.999	.004
1.150	.580	.831	.318	3.150	2.502	.999	.003
1.200	.622	.847	.294	3.200	2.552	.999	.003
1.250	.665	.861	.271	3.250	2.602	.999	.002
1.300	.708	.874	.250	3.300	2.652	.999	.002
1.350	.752	.886	.230	3.350	2.702	1.000	.002
1.400	.797	.897	.211	3.400	2.752	1.000	.001
1.450	.842	.907	.193	3.450	2.802	1.000	.001
1.500	.887	.916	.177	3.500	2.852	1.000	.001
1.550	.933	.925	.162	3.550	2.902	1.000	.001
1.600	.980	.932	.147	3.600	2.952	1.000	.001
1.650	1.027	.939	.134	3.650	3.002	1.000	.001
1.700	1.074	.946	.122	3.700	3.052	1.000	.001
1.750	1.121	.952	.110	3.750	3.102	1.000	.000
1.800	1.169	.957	.100	3.800	3.152	1.000	.000
1.850	1.217	.962	.090	3.850	3.202	1.000	.000
1.900	1.265	.966	.081	3.900	3.252	1.000	.000
1.950	1.313	.970	.073	3.950	3.302	1.000	.000
				4.000	3.352	1.000	.000

(10) $n = 1$ and $m = 2$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.748	2.000	1.555	1.004	0.004
.050	.002	.085	1.648	2.050	1.605	1.004	0.002
.100	.008	.165	1.549	2.100	1.655	1.004	.000
.150	.019	.240	1.451	2.150	1.705	1.004	-.002
.200	.032	.310	1.356	2.200	1.755	1.004	-.003
.250	.049	.375	1.262	2.250	1.806	1.004	-.004
.300	.070	.436	1.172	2.300	1.856	1.004	-.004
.350	.093	.493	1.085	2.350	1.906	1.004	-.005
.400	.119	.545	1.001	2.400	1.956	1.004	-.005
.450	.147	.593	.921	2.450	2.006	1.003	-.005
.500	.178	.637	.845	2.500	2.057	1.003	-.005
.550	.211	.677	.773	2.550	2.107	1.003	-.005
.600	.246	.714	.705	2.600	2.157	1.003	-.005
.650	.282	.748	.641	2.650	2.207	1.002	-.004
.700	.321	.779	.581	2.700	2.257	1.002	-.004
.750	.360	.806	.525	2.750	2.307	1.002	-.004
.800	.401	.831	.472	2.800	2.357	1.002	-.004
.850	.443	.853	.424	2.850	2.407	1.002	-.003
.900	.487	.874	.379	2.900	2.457	1.001	-.003
.950	.531	.891	.338	2.950	2.507	1.001	-.003
1.000	.576	.907	.300	3.000	2.557	1.001	-.003
1.050	.621	.921	.265	3.050	2.608	1.001	-.002
1.100	.668	.934	.233	3.100	2.658	1.001	-.002
1.150	.715	.945	.205	3.150	2.708	1.001	-.002
1.200	.762	.954	.179	3.200	2.758	1.001	-.002
1.250	.810	.963	.155	3.250	2.808	1.001	-.002
1.300	.858	.970	.134	3.300	2.858	1.000	-.001
1.350	.907	.976	.115	3.350	2.908	1.000	-.001
1.400	.956	.981	.098	3.400	2.958	1.000	-.001
1.450	1.005	.986	.083	3.450	3.008	1.000	-.001
1.500	1.055	.990	.070	3.500	3.058	1.000	-.001
1.550	1.104	.993	.058	3.550	3.108	1.000	-.001
1.600	1.154	.996	.048	3.600	3.158	1.000	-.001
1.650	1.204	.998	.039	3.650	3.208	1.000	-.001
1.700	1.254	1.000	.031	3.700	3.258	1.000	.000
1.750	1.304	1.001	.025	3.750	3.308	1.000	.000
1.800	1.354	1.002	.019	3.800	3.358	1.000	.000
1.850	1.404	1.003	.014	3.850	3.408	1.000	.000
1.900	1.454	1.004	.010	3.900	3.458	1.000	.000
1.950	1.504	1.004	.007	3.950	3.508	1.000	.000
				4.000	3.558	1.000	.000

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(11) $n = 1$ and $m = 4$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	2.590	2.000	1.784	1.026	-0.050
.050	.003	.124	2.390	2.050	1.836	1.023	-.047
.100	.012	.239	2.193	2.100	1.887	1.021	-.044
.150	.027	.344	2.001	2.150	1.938	1.019	-.040
.200	.047	.439	1.815	2.200	1.989	1.017	-.037
.250	.071	.526	1.637	2.250	2.039	1.015	-.034
.300	.099	.603	1.468	2.300	2.090	1.014	-.031
.350	.131	.672	1.308	2.350	2.141	1.012	-.029
.400	.166	.734	1.159	2.400	2.191	1.011	-.026
.450	.204	.788	1.020	2.450	2.242	1.010	-.024
.500	.245	.836	.891	2.500	2.292	1.008	-.021
.550	.288	.878	.773	2.550	2.343	1.007	-.019
.600	.332	.914	.665	2.600	2.393	1.007	-.017
.650	.379	.944	.567	2.650	2.443	1.006	-.015
.700	.427	.971	.479	2.700	2.494	1.005	-.014
.750	.476	.992	.400	2.750	2.544	1.004	-.012
.800	.526	1.011	.329	2.800	2.594	1.004	-.011
.850	.577	1.026	.267	2.850	2.644	1.003	-.009
.900	.628	1.037	.212	2.900	2.694	1.003	-.008
.950	.681	1.047	.164	2.950	2.744	1.002	-.007
1.000	.733	1.054	.122	3.000	2.795	1.002	-.006
1.050	.786	1.059	.086	3.050	2.845	1.002	-.006
1.100	.839	1.063	.055	3.100	2.895	1.002	-.005
1.150	.892	1.065	.029	3.150	2.945	1.001	-.004
1.200	.945	1.066	.007	3.200	2.995	1.001	-.004
1.250	.999	1.065	-.011	3.250	3.045	1.001	-.003
1.300	1.052	1.065	-.025	3.300	3.095	1.001	-.003
1.350	1.105	1.063	-.037	3.350	3.145	1.001	-.002
1.400	1.158	1.061	-.046	3.400	3.195	1.001	-.002
1.450	1.211	1.058	-.053	3.450	3.245	1.000	-.002
1.500	1.264	1.056	-.058	3.500	3.295	1.000	-.001
1.550	1.317	1.053	-.061	3.550	3.345	1.000	-.001
1.600	1.369	1.050	-.063	3.600	3.395	1.000	-.001
1.650	1.422	1.046	-.064	3.650	3.445	1.000	-.001
1.700	1.474	1.043	-.063	3.700	3.495	1.000	-.001
1.750	1.526	1.040	-.062	3.750	3.545	1.000	-.001
1.800	1.578	1.037	-.060	3.800	3.595	1.000	-.001
1.850	1.630	1.034	-.058	3.850	3.645	1.000	.000
1.900	1.681	1.031	-.056	3.900	3.695	1.000	.000
1.950	1.733	1.028	-.053	3.950	3.745	1.000	.000
				4.000	3.795	1.000	.000

(12) $n = 1$ and $m = 6$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	3.300	2.000	1.928	1.032	-0.070
.050	.004	.158	3.001	2.050	1.978	1.028	-.064
.100	.016	.300	2.707	2.100	2.029	1.025	-.059
.150	.034	.428	2.422	2.150	2.080	1.023	-.053
.200	.058	.543	2.149	2.200	2.132	1.020	-.048
.250	.088	.643	1.891	2.250	2.182	1.018	-.044
.300	.122	.732	1.650	2.300	2.233	1.016	-.039
.350	.161	.809	1.426	2.350	2.284	1.014	-.035
.400	.203	.875	1.220	2.400	2.335	1.012	-.032
.450	.248	.931	1.033	2.450	2.385	1.011	-.028
.500	.296	.978	.863	2.500	2.436	1.009	-.025
.550	.346	1.018	.711	2.550	2.486	1.008	-.022
.600	.398	1.050	.576	2.600	2.537	1.007	-.020
.650	.451	1.076	.457	2.650	2.587	1.006	-.017
.700	.505	1.096	.353	2.700	2.637	1.005	-.015
.750	.560	1.111	.262	2.750	2.687	1.005	-.013
.800	.616	1.122	.184	2.800	2.738	1.004	-.012
.850	.672	1.130	.118	2.850	2.788	1.003	-.010
.900	.729	1.134	.062	2.900	2.838	1.003	-.009
.950	.786	1.136	.015	2.950	2.888	1.003	-.008
1.000	.843	1.136	-.023	3.000	2.938	1.002	-.007
1.050	.899	1.134	-.054	3.050	2.988	1.002	-.006
1.100	.956	1.130	-.079	3.100	3.038	1.002	-.005
1.150	1.012	1.126	-.097	3.150	3.088	1.001	-.004
1.200	1.068	1.121	-.111	3.200	3.139	1.001	-.004
1.250	1.124	1.115	-.121	3.250	3.189	1.001	-.003
1.300	1.180	1.109	-.128	3.300	3.239	1.001	-.003
1.350	1.235	1.102	-.131	3.350	3.289	1.001	-.002
1.400	1.290	1.096	-.132	3.400	3.339	1.001	-.002
1.450	1.345	1.089	-.131	3.450	3.389	1.000	-.002
1.500	1.399	1.083	-.129	3.500	3.439	1.000	-.001
1.550	1.453	1.076	-.125	3.550	3.489	1.000	-.001
1.600	1.507	1.070	-.120	3.600	3.539	1.000	-.001
1.650	1.560	1.064	-.115	3.650	3.589	1.000	-.001
1.700	1.613	1.059	-.109	3.700	3.639	1.000	-.001
1.750	1.666	1.053	-.102	3.750	3.689	1.000	-.001
1.800	1.718	1.048	-.096	3.800	3.739	1.000	-.001
1.850	1.771	1.044	-.089	3.850	3.789	1.000	.000
1.900	1.823	1.039	-.083	3.900	3.839	1.000	.000
1.950	1.875	1.035	-.076	3.950	3.889	1.000	.000
				4.000	3.939	1.000	.000

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(13) $n = 1$ and $m = 8$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	3.934	2.000	2.028	1.033	-0.079
.050	.005	.187	3.595	2.050	2.079	1.030	-.071
.100	.018	.354	3.145	2.100	2.131	1.026	-.064
.150	.040	.501	2.769	2.150	2.182	1.023	-.058
.200	.068	.631	2.412	2.200	2.233	1.021	-.052
.250	.103	.743	2.079	2.250	2.284	1.018	-.047
.300	.142	.839	1.770	2.300	2.335	1.016	-.042
.350	.186	.920	1.488	2.350	2.386	1.014	-.037
.400	.234	.988	1.233	2.400	2.436	1.012	-.033
.450	.285	1.044	1.005	2.450	2.487	1.011	-.029
.500	.338	1.089	.802	2.500	2.537	1.009	-.026
.550	.394	1.125	.625	2.550	2.588	1.008	-.023
.600	.451	1.152	.470	2.600	2.638	1.007	-.020
.650	.509	1.172	.337	2.650	2.688	1.006	-.018
.700	.568	1.186	.224	2.700	2.739	1.005	-.015
.750	.627	1.195	.129	2.750	2.789	1.004	-.013
.800	.687	1.199	.050	2.800	2.839	1.004	-.012
.850	.747	1.200	-.015	2.850	2.889	1.003	-.010
.900	.807	1.198	-.067	2.900	2.939	1.003	-.009
.950	.867	1.194	-.108	2.950	2.990	1.002	-.008
1.000	.926	1.187	-.140	3.000	3.040	1.002	-.007
1.050	.986	1.180	-.164	3.050	3.090	1.002	-.006
1.100	1.044	1.171	-.180	3.100	3.140	1.001	-.005
1.150	1.103	1.162	-.191	3.150	3.190	1.001	-.004
1.200	1.161	1.152	-.197	3.200	3.240	1.001	-.004
1.250	1.218	1.142	-.198	3.250	3.290	1.001	-.003
1.300	1.275	1.132	-.197	3.300	3.340	1.001	-.003
1.350	1.331	1.123	-.193	3.350	3.390	1.001	-.002
1.400	1.387	1.113	-.187	3.400	3.440	1.001	-.002
1.450	1.443	1.104	-.180	3.450	3.490	1.000	-.002
1.500	1.498	1.095	-.171	3.500	3.540	1.000	-.001
1.550	1.552	1.087	-.162	3.550	3.590	1.000	-.001
1.600	1.606	1.079	-.152	3.600	3.640	1.000	-.001
1.650	1.660	1.072	-.142	3.650	3.690	1.000	-.001
1.700	1.713	1.065	-.132	3.700	3.740	1.000	-.001
1.750	1.766	1.058	-.123	3.750	3.790	1.000	-.001
1.800	1.819	1.052	-.113	3.800	3.840	1.000	-.001
1.850	1.872	1.047	-.104	3.850	3.890	1.000	.000
1.900	1.924	1.042	-.095	3.900	3.940	1.000	.000
1.950	1.976	1.038	-.086	3.950	3.990	1.000	.000
				4.000	4.040	1.000	.000

(14) $n = 1$ and $m = 10$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	4.516	2.000	2.106	1.034	-0.082
.050	.005	.213	4.018	2.050	2.157	1.030	-.074
.100	.021	.402	3.532	2.100	2.209	1.026	-.066
.150	.045	.567	3.066	2.150	2.260	1.023	-.059
.200	.077	.709	2.628	2.200	2.311	1.020	-.053
.250	.116	.830	2.222	2.250	2.362	1.018	-.047
.300	.160	.932	1.851	2.300	2.413	1.016	-.042
.350	.209	.016	1.516	2.350	2.464	1.014	-.037
.400	.261	.084	1.217	2.400	2.514	1.012	-.033
.450	.317	1.138	.954	2.450	2.565	1.010	-.029
.500	.375	1.180	.725	2.500	2.615	1.009	-.026
.550	.435	1.211	.527	2.550	2.666	1.008	-.022
.600	.496	1.233	.359	2.600	2.716	1.007	-.020
.650	.558	1.248	.218	2.650	2.766	1.006	-.017
.700	.620	1.255	.101	2.700	2.817	1.005	-.015
.750	.683	1.258	.005	2.750	2.867	1.004	-.013
.800	.746	1.256	-.071	2.800	2.917	1.004	-.011
.850	.809	1.251	-.132	2.850	2.967	1.003	-.010
.900	.871	1.243	-.178	2.900	3.017	1.003	-.009
.950	.933	1.234	-.212	2.950	3.068	1.002	-.007
1.000	.995	1.222	-.235	3.000	3.118	1.002	-.006
1.050	1.055	1.210	-.251	3.050	3.168	1.002	-.006
1.100	1.116	1.197	-.259	3.100	3.218	1.001	-.005
1.150	1.175	1.184	-.261	3.150	3.268	1.001	-.004
1.200	1.234	1.171	-.259	3.200	3.318	1.001	-.003
1.250	1.292	1.158	-.254	3.250	3.368	1.001	-.003
1.300	1.350	1.146	-.245	3.300	3.418	1.001	-.003
1.350	1.407	1.134	-.235	3.350	3.468	1.001	-.002
1.400	1.469	1.122	-.224	3.400	3.518	1.000	-.002
1.450	1.519	1.112	-.211	3.450	3.568	1.000	-.002
1.500	1.574	1.101	-.198	3.500	3.618	1.000	-.001
1.550	1.629	1.092	-.184	3.550	3.668	1.000	-.001
1.600	1.684	1.083	-.171	3.600	3.718	1.000	-.001
1.650	1.738	1.075	-.158	3.650	3.768	1.000	-.001
1.700	1.791	1.067	-.145	3.700	3.818	1.000	-.001
1.750	1.844	1.060	-.133	3.750	3.868	1.000	-.001
1.800	1.897	1.054	-.122	3.800	3.918	1.000	-.001
1.850	1.950	1.048	-.111	3.850	3.968	1.000	.000
1.900	2.002	1.043	-.100	3.900	4.018	1.000	.000
1.950	2.054	1.038	-.091	3.950	4.068	1.000	.000
				4.000	4.118	1.000	.000

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(15) $n = 2$ and $m = 0$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	0.716	2.000	1.192	0.960	0.111
.050	.001	.036	.716	2.050	1.240	.965	.099
.100	.004	.072	.716	2.100	1.289	.970	.087
.150	.008	.107	.715	2.150	1.337	.974	.077
.200	.014	.143	.714	2.200	1.386	.978	.068
.250	.022	.179	.712	2.250	1.435	.981	.060
.300	.032	.214	.709	2.300	1.484	.984	.052
.350	.044	.250	.704	2.350	1.533	.986	.045
.400	.057	.285	.699	2.400	1.583	.988	.039
.450	.072	.319	.692	2.450	1.632	.990	.034
.500	.089	.354	.684	2.500	1.682	.991	.029
.550	.108	.388	.674	2.550	1.731	.993	.025
.600	.128	.421	.663	2.600	1.781	.994	.021
.650	.150	.454	.650	2.650	1.831	.995	.018
.700	.173	.486	.636	2.700	1.881	.996	.015
.750	.198	.518	.620	2.750	1.930	.997	.013
.800	.225	.548	.603	2.800	1.980	.997	.011
.850	.253	.578	.585	2.850	2.030	.998	.009
.900	.283	.607	.565	2.900	2.080	.998	.008
.950	.314	.635	.545	2.950	2.130	.998	.006
1.000	.346	.661	.523	3.000	2.180	.999	.005
1.050	.380	.687	.501	3.050	2.230	.999	.004
1.100	.415	.711	.478	3.100	2.280	.999	.004
1.150	.451	.735	.454	3.150	2.330	.999	.003
1.200	.488	.757	.430	3.200	2.380	.999	.002
1.250	.527	.778	.406	3.250	2.430	1.000	.002
1.300	.566	.797	.382	3.300	2.480	1.000	.002
1.350	.606	.816	.358	3.350	2.530	1.000	.001
1.400	.648	.833	.334	3.400	2.580	1.000	.001
1.450	.690	.849	.311	3.450	2.630	1.000	.001
1.500	.733	.864	.289	3.500	2.680	1.000	.001
1.550	.776	.878	.267	3.550	2.730	1.000	.001
1.600	.820	.891	.245	3.600	2.780	1.000	.000
1.650	.865	.903	.225	3.650	2.830	1.000	.000
1.700	.911	.913	.206	3.700	2.880	1.000	.000
1.750	.956	.923	.187	3.750	2.930	1.000	.000
1.800	1.003	.932	.170	3.800	2.980	1.000	.000
1.850	1.050	.940	.153	3.850	3.030	1.000	.000
1.900	1.097	.948	.138	3.900	3.080	1.000	.000
1.950	1.144	.954	.124	3.950	3.130	1.000	.000
				4.000	3.180	1.000	.000

(16) $n = 2$ and $m = 1$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.265	2.000	1.395	0.984	0.049
.050	.002	.062	1.215	2.050	1.445	.987	.042
.100	.006	.122	1.165	2.100	1.494	.989	.037
.150	.014	.179	1.116	2.150	1.543	.990	.032
.200	.024	.233	1.067	2.200	1.593	.992	.028
.250	.037	.285	1.018	2.250	1.643	.993	.024
.300	.052	.335	.970	2.300	1.692	.994	.020
.350	.070	.382	.922	2.350	1.742	.995	.017
.400	.091	.427	.876	2.400	1.792	.996	.015
.450	.113	.470	.830	2.450	1.842	.997	.013
.500	.138	.510	.785	2.500	1.891	.997	.011
.550	.164	.548	.741	2.550	1.941	.998	.009
.600	.192	.584	.698	2.600	1.991	.998	.008
.650	.222	.618	.657	2.650	2.041	.998	.006
.700	.254	.650	.616	2.700	2.091	.999	.005
.750	.287	.680	.577	2.750	2.141	.999	.004
.800	.322	.708	.539	2.800	2.191	.999	.004
.850	.358	.734	.503	2.850	2.241	.999	.003
.900	.395	.758	.468	2.900	2.291	.999	.002
.950	.434	.780	.434	2.950	2.341	1.000	.002
1.000	.473	.801	.402	3.000	2.391	1.000	.002
1.050	.514	.821	.371	3.050	2.441	1.000	.001
1.100	.555	.838	.342	3.100	2.491	1.000	.001
1.150	.598	.855	.314	3.150	2.541	1.000	.001
1.200	.641	.870	.288	3.200	2.591	1.000	.001
1.250	.685	.884	.263	3.250	2.641	1.000	.001
1.300	.729	.896	.240	3.300	2.691	1.000	.000
1.350	.774	.908	.218	3.350	2.741	1.000	.000
1.400	.820	.918	.198	3.400	2.791	1.000	.000
1.450	.866	.928	.179	3.450	2.841	1.000	.000
1.500	.913	.936	.161	3.500	2.891	1.000	.000
1.550	.960	.944	.145	3.550	2.941	1.000	.000
1.600	1.007	.951	.130	3.600	2.991	1.000	.000
1.650	1.055	.957	.116	3.650	3.041	1.000	.000
1.700	1.103	.962	.104	3.700	3.091	1.000	.000
1.750	1.151	.967	.092	3.750	3.141	1.000	.000
1.800	1.200	.971	.082	3.800	3.191	1.000	.000
1.850	1.248	.975	.072	3.850	3.241	1.000	.000
1.900	1.297	.979	.063	3.900	3.291	1.000	.000
1.950	1.346	.982	.056	3.950	3.341	1.000	.000
				4.000	3.391	1.000	.000

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(17) n = 2 and m = 2

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.715	2.000	1.525	0.995	0.018
.050	.002	.083	1.615	2.050	1.575	.996	.015
.100	.008	.162	1.516	2.100	1.624	.997	.013
.150	.018	.235	1.419	2.150	1.674	.997	.011
.200	.032	.303	1.324	2.200	1.724	.998	.009
.250	.048	.367	1.231	2.250	1.774	.998	.007
.300	.068	.427	1.142	2.300	1.824	.998	.006
.350	.091	.482	1.056	2.350	1.874	.999	.005
.400	.116	.532	.974	2.400	1.924	.999	.004
.450	.144	.579	.896	2.450	1.974	.999	.004
.500	.174	.622	.821	2.500	2.024	.999	.003
.550	.206	.661	.751	2.550	2.074	.999	.002
.600	.240	.697	.686	2.600	2.124	1.000	.002
.650	.276	.730	.624	2.650	2.174	1.000	.002
.700	.313	.760	.566	2.700	2.224	1.000	.001
.750	.352	.787	.513	2.750	2.274	1.000	.001
.800	.392	.811	.463	2.800	2.324	1.000	.001
.850	.433	.833	.417	2.850	2.374	1.000	.001
.900	.475	.853	.375	2.900	2.424	1.000	.001
.950	.518	.870	.336	2.950	2.474	1.000	.000
1.000	.562	.886	.300	3.000	2.524	1.000	.000
1.050	.607	.900	.267	3.050	2.574	1.000	.000
1.100	.652	.913	.238	3.100	2.624	1.000	.000
1.150	.698	.924	.211	3.150	2.674	1.000	.000
1.200	.745	.934	.186	3.200	2.724	1.000	.000
1.250	.791	.943	.164	3.250	2.774	1.000	.000
1.300	.839	.951	.145	3.300	2.824	1.000	.000
1.350	.886	.957	.127	3.350	2.874	1.000	.000
1.400	.935	.963	.111	3.400	2.924	1.000	.000
1.450	.983	.969	.097	3.450	2.974	1.000	.000
1.500	1.031	.973	.084	3.500	3.024	1.000	.000
1.550	1.080	.977	.073	3.550	3.074	1.000	.000
1.600	1.129	.980	.063	3.600	3.124	1.000	.000
1.650	1.178	.983	.055	3.650	3.174	1.000	.000
1.700	1.227	.986	.047	3.700	3.224	1.000	.000
1.750	1.277	.988	.040	3.750	3.274	1.000	.000
1.800	1.326	.990	.035	3.800	3.324	1.000	.000
1.850	1.376	.992	.030	3.850	3.374	1.000	.000
1.900	1.425	.993	.025	3.900	3.424	1.000	.000
1.950	1.475	.994	.021	3.950	3.474	1.000	.000
				4.000	3.524	1.000	.000

(18) n = 2 and m = 4

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	2.465	2.000	1.689	1.003	-0.009
.050	.003	.118	2.265	2.050	1.739	1.003	-.008
.100	.012	.227	2.069	2.100	1.789	1.003	-.007
.150	.025	.325	1.878	2.150	1.839	1.002	-.007
.200	.044	.415	1.695	2.200	1.889	1.002	-.006
.250	.067	.495	1.521	2.250	1.940	1.002	-.005
.300	.093	.567	1.357	2.300	1.990	1.001	-.005
.350	.123	.631	1.204	2.350	2.040	1.001	-.004
.400	.156	.687	1.062	2.400	2.090	1.001	-.003
.450	.192	.737	.932	2.450	2.140	1.001	-.003
.500	.230	.781	.813	2.500	2.190	1.001	-.003
.550	.270	.819	.705	2.550	2.240	1.001	-.002
.600	.312	.851	.607	2.600	2.290	1.000	-.002
.650	.355	.879	.520	2.650	2.340	1.000	-.002
.700	.400	.903	.442	2.700	2.390	1.000	-.001
.750	.445	.924	.373	2.750	2.440	1.000	-.001
.800	.492	.941	.313	2.800	2.490	1.000	-.001
.850	.539	.955	.260	2.850	2.540	1.000	-.001
.900	.587	.967	.214	2.900	2.590	1.000	-.001
.950	.636	.977	.174	2.950	2.640	1.000	-.001
1.000	.685	.985	.140	3.000	2.690	1.000	.000
1.050	.734	.991	.111	3.050	2.740	1.000	.000
1.100	.784	.996	.087	3.100	2.790	1.000	.000
1.150	.834	1.000	.066	3.150	2.840	1.000	.000
1.200	.884	1.003	.049	3.200	2.890	1.000	.000
1.250	.934	1.005	.035	3.250	2.940	1.000	.000
1.300	.985	1.006	.024	3.300	2.990	1.000	.000
1.350	1.035	1.007	.015	3.350	3.040	1.000	.000
1.400	1.085	1.008	.008	3.400	3.090	1.000	.000
1.450	1.136	1.008	.002	3.450	3.140	1.000	.000
1.500	1.186	1.008	-.002	3.500	3.190	1.000	.000
1.550	1.236	1.008	-.005	3.550	3.240	1.000	.000
1.600	1.287	1.007	-.008	3.600	3.290	1.000	.000
1.650	1.337	1.007	-.009	3.650	3.340	1.000	.000
1.700	1.387	1.006	-.010	3.700	3.390	1.000	.000
1.750	1.438	1.006	-.010	3.750	3.440	1.000	.000
1.800	1.488	1.005	-.011	3.800	3.490	1.000	.000
1.850	1.538	1.005	-.010	3.850	3.540	1.000	.000
1.900	1.589	1.004	-.010	3.900	3.590	1.000	.000
1.950	1.639	1.004	-.009	3.950	3.640	1.000	.000
				4.000	3.690	1.000	.000

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(19) $n = 2$ and $m = 6$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	3.103	2.000	1.794	1.006	-0.018
.050	.004	.148	2.804	2.050	1.844	1.005	-.016
.100	.015	.281	2.511	2.100	1.894	1.004	-.014
.150	.032	.399	2.230	2.150	1.945	1.004	-.012
.200	.054	.504	1.963	2.200	1.995	1.003	-.011
.250	.082	.596	1.713	2.250	2.045	1.003	-.009
.300	.114	.675	1.482	2.300	2.095	1.002	-.008
.350	.149	.744	1.271	2.350	2.145	1.002	-.007
.400	.188	.803	1.079	2.400	2.195	1.001	-.006
.450	.229	.852	.908	2.450	2.245	1.001	-.005
.500	.273	.894	.756	2.500	2.295	1.001	-.004
.550	.318	.928	.621	2.550	2.345	1.001	-.003
.600	.366	.956	.504	2.600	2.395	1.001	-.003
.650	.414	.979	.403	2.650	2.445	1.001	-.002
.700	.463	.997	.316	2.700	2.496	1.000	-.002
.750	.514	1.011	.242	2.750	2.546	1.000	-.002
.800	.564	1.021	.179	2.800	2.596	1.000	-.001
.850	.616	1.029	.127	2.850	2.646	1.000	-.001
.900	.667	1.034	.085	2.900	2.696	1.000	-.001
.950	.719	1.037	.050	2.950	2.746	1.000	-.001
1.000	.771	1.039	.022	3.000	2.796	1.000	-.001
1.050	.823	1.040	.000	3.050	2.846	1.000	.000
1.100	.875	1.039	-.016	3.100	2.896	1.000	.000
1.150	.927	1.038	-.029	3.150	2.946	1.000	.000
1.200	.979	1.036	-.038	3.200	2.996	1.000	.000
1.250	1.030	1.034	-.044	3.250	3.046	1.000	.000
1.300	1.082	1.032	-.048	3.300	3.096	1.000	.000
1.350	1.134	1.030	-.049	3.350	3.146	1.000	.000
1.400	1.185	1.027	-.050	3.400	3.196	1.000	.000
1.450	1.236	1.025	-.049	3.450	3.246	1.000	.000
1.500	1.288	1.022	-.047	3.500	3.296	1.000	.000
1.550	1.339	1.020	-.045	3.550	3.346	1.000	.000
1.600	1.390	1.018	-.042	3.600	3.396	1.000	.000
1.650	1.440	1.016	-.039	3.650	3.446	1.000	.000
1.700	1.491	1.014	-.036	3.700	3.496	1.000	.000
1.750	1.542	1.012	-.033	3.750	3.546	1.000	.000
1.800	1.592	1.011	-.030	3.800	3.596	1.000	.000
1.850	1.643	1.009	-.026	3.850	3.646	1.000	.000
1.900	1.693	1.008	-.024	3.900	3.696	1.000	.000
1.950	1.744	1.007	-.021	3.950	3.746	1.000	.000
				4.000	3.796	1.000	.000

(20) $n = 2$ and $m = 8$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	3.674	2.000	1.870	1.007	-0.022
.050	.004	.174	3.276	2.050	1.920	1.006	-.019
.100	.017	.328	2.888	2.100	1.970	1.005	-.016
.150	.037	.463	2.517	2.150	2.021	1.004	-.014
.200	.063	.580	2.169	2.200	2.071	1.003	-.012
.250	.095	.680	1.848	2.250	2.121	1.003	-.010
.300	.131	.765	1.556	2.300	2.171	1.002	-.009
.350	.171	.836	1.294	2.350	2.221	1.002	-.007
.400	.214	.895	1.061	2.400	2.271	1.002	-.006
.450	.260	.943	.856	2.450	2.321	1.001	-.005
.500	.308	.981	.678	2.500	2.371	1.001	-.004
.550	.358	1.011	.526	2.550	2.421	1.001	-.003
.600	.409	1.034	.396	2.600	2.471	1.001	-.003
.650	.461	1.051	.287	2.650	2.522	1.001	-.002
.700	.514	1.063	.197	2.700	2.572	1.000	-.002
.750	.568	1.071	.123	2.750	2.622	1.000	-.002
.800	.621	1.076	.064	2.800	2.672	1.000	-.001
.850	.675	1.078	.017	2.850	2.722	1.000	-.001
.900	.729	1.077	-.020	2.900	2.772	1.000	-.001
.950	.783	1.076	-.048	2.950	2.822	1.000	-.001
1.000	.837	1.073	-.068	3.000	2.872	1.000	-.001
1.050	.890	1.069	-.082	3.050	2.922	1.000	.000
1.100	.944	1.065	-.090	3.100	2.972	1.000	.000
1.150	.997	1.060	-.095	3.150	3.022	1.000	.000
1.200	1.050	1.055	-.097	3.200	3.072	1.000	.000
1.250	1.102	1.050	-.096	3.250	3.122	1.000	.000
1.300	1.155	1.046	-.093	3.300	3.172	1.000	.000
1.350	1.207	1.041	-.089	3.350	3.222	1.000	.000
1.400	1.259	1.037	-.084	3.400	3.272	1.000	.000
1.450	1.310	1.033	-.078	3.450	3.322	1.000	.000
1.500	1.362	1.029	-.072	3.500	3.372	1.000	.000
1.550	1.413	1.025	-.066	3.550	3.422	1.000	.000
1.600	1.465	1.022	-.060	3.600	3.472	1.000	.000
1.650	1.516	1.019	-.054	3.650	3.522	1.000	.000
1.700	1.567	1.017	-.049	3.700	3.572	1.000	.000
1.750	1.617	1.015	-.043	3.750	3.622	1.000	.000
1.800	1.668	1.013	-.038	3.800	3.672	1.000	.000
1.850	1.719	1.011	-.034	3.850	3.722	1.000	.000
1.900	1.769	1.009	-.029	3.900	3.772	1.000	.000
1.950	1.819	1.008	-.026	3.950	3.822	1.000	.000
				4.000	3.872	1.000	.000

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(21) $n = 2$ and $m = 10$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	4.199	2.000	1.929	1.007	-0.024
.050	.005	.197	3.702	2.050	1.979	1.006	-.020
.100	.019	.370	3.219	2.100	2.029	1.005	-.017
.150	.042	.520	2.761	2.150	2.079	1.004	-.015
.200	.071	.647	2.335	2.200	2.130	1.003	-.012
.250	.106	.754	1.947	2.250	2.180	1.003	-.010
.300	.146	.842	1.599	2.300	2.230	1.002	-.009
.350	.190	.914	1.290	2.350	2.280	1.002	-.007
.400	.237	.972	1.021	2.400	2.330	1.002	-.006
.450	.287	1.017	.789	2.450	2.380	1.001	-.005
.500	.339	1.052	.592	2.500	2.430	1.001	-.004
.550	.392	1.077	.426	2.550	2.480	1.001	-.003
.600	.446	1.095	.290	2.600	2.530	1.001	-.003
.650	.501	1.106	.178	2.650	2.580	1.001	-.002
.700	.557	1.113	.088	2.700	2.630	1.000	-.002
.750	.613	1.115	.018	2.750	2.680	1.000	-.002
.800	.668	1.115	-.036	2.800	2.730	1.000	-.001
.850	.724	1.112	-.077	2.850	2.780	1.000	-.001
.900	.780	1.107	-.106	2.900	2.830	1.000	-.001
.950	.835	1.102	-.125	2.950	2.880	1.000	-.001
1.000	.890	1.095	-.138	3.000	2.930	1.000	-.001
1.050	.944	1.088	-.144	3.050	2.980	1.000	.000
1.100	.999	1.081	-.145	3.100	3.030	1.000	.000
1.150	1.052	1.074	-.143	3.150	3.080	1.000	.000
1.200	1.106	1.066	-.138	3.200	3.130	1.000	.000
1.250	1.159	1.060	-.132	3.250	3.180	1.000	.000
1.300	1.212	1.053	-.124	3.300	3.230	1.000	.000
1.350	1.264	1.047	-.115	3.350	3.280	1.000	.000
1.400	1.317	1.042	-.106	3.400	3.330	1.000	.000
1.450	1.369	1.037	-.096	3.450	3.380	1.000	.000
1.500	1.420	1.032	-.087	3.500	3.430	1.000	.000
1.550	1.472	1.028	-.079	3.550	3.480	1.000	.000
1.600	1.523	1.024	-.070	3.600	3.530	1.000	.000
1.650	1.574	1.021	-.062	3.650	3.580	1.000	.000
1.700	1.625	1.018	-.055	3.700	3.630	1.000	.000
1.750	1.676	1.016	-.048	3.750	3.680	1.000	.000
1.800	1.727	1.013	-.042	3.800	3.730	1.000	.000
1.850	1.777	1.011	-.037	3.850	3.780	1.000	.000
1.900	1.828	1.010	-.032	3.900	3.830	1.000	.000
1.950	1.878	1.008	-.028	3.950	3.880	1.000	.000
				4.000	3.930	1.000	.000

(22) $n = 4$ and $m = 0$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	0.939	1.500	0.884	0.955	0.158
.050	.001	.047	.939	1.550	.932	.962	.136
.100	.005	.094	.938	1.600	.980	.969	.117
.150	.011	.141	.936	1.650	1.029	.974	.100
.200	.019	.187	.932	1.700	1.078	.979	.084
.250	.029	.234	.926	1.750	1.127	.983	.071
.300	.042	.280	.917	1.800	1.176	.986	.059
.350	.057	.326	.905	1.850	1.225	.989	.049
.400	.075	.370	.890	1.900	1.275	.991	.041
.450	.094	.414	.871	1.950	1.324	.993	.033
.500	.116	.457	.849	2.000	1.374	.994	.027
.550	.140	.499	.824	2.050	1.424	.995	.022
.600	.166	.540	.795	2.100	1.474	.996	.018
.650	.194	.579	.764	2.150	1.523	.997	.014
.700	.224	.616	.730	2.200	1.573	.998	.011
.750	.256	.652	.693	2.250	1.623	.998	.009
.800	.289	.685	.655	2.300	1.673	.999	.007
.850	.324	.717	.615	2.350	1.723	.999	.005
.900	.361	.747	.575	2.400	1.773	.999	.004
.950	.399	.775	.534	2.450	1.823	.999	.003
1.000	.438	.800	.492	2.500	1.873	1.000	.003
1.050	.479	.824	.452	2.550	1.923	1.000	.002
1.100	.521	.846	.412	2.600	1.973	1.000	.001
1.150	.563	.865	.373	2.650	2.023	1.000	.001
1.200	.607	.883	.336	2.700	2.073	1.000	.001
1.250	.652	.899	.301	2.750	2.123	1.000	.001
1.300	.697	.913	.268	2.800	2.173	1.000	.000
1.350	.743	.926	.237	2.850	2.223	1.000	.000
1.400	.789	.937	.208	2.900	2.273	1.000	.000
1.450	.836	.947	.182	2.950	2.323	1.000	.000
				3.000	2.373	1.000	.000

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(23) $n = 4$ and $m = 1$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.375	1.500	0.982	0.973	0.100
.050	.002	.068	1.325	1.550	1.031	.978	.085
.100	.007	.132	1.275	1.600	1.080	.982	.072
.150	.015	.195	1.224	1.650	1.129	.985	.061
.200	.026	.255	1.173	1.700	1.178	.988	.051
.250	.040	.312	1.122	1.750	1.228	.990	.042
.300	.057	.367	1.070	1.800	1.277	.992	.035
.350	.077	.419	1.018	1.850	1.327	.994	.028
.400	.099	.469	.965	1.900	1.377	.995	.023
.450	.124	.516	.913	1.950	1.426	.996	.019
.500	.151	.560	.860	2.000	1.476	.997	.015
.550	.180	.602	.807	2.050	1.526	.998	.012
.600	.211	.641	.755	2.100	1.576	.998	.010
.650	.244	.677	.703	2.150	1.626	.999	.008
.700	.279	.711	.652	2.200	1.676	.999	.006
.750	.315	.742	.602	2.250	1.726	.999	.005
.800	.353	.771	.554	2.300	1.776	.999	.004
.850	.392	.798	.507	2.350	1.826	.999	.003
.900	.433	.822	.461	2.400	1.876	1.000	.002
.950	.474	.844	.418	2.450	1.926	1.000	.002
1.000	.517	.864	.377	2.500	1.976	1.000	.001
1.050	.561	.882	.339	2.550	2.026	1.000	.001
1.100	.605	.898	.302	2.600	2.076	1.000	.001
1.150	.650	.912	.268	2.650	2.126	1.000	.001
1.200	.696	.925	.237	2.700	2.176	1.000	.000
1.250	.743	.936	.208	2.750	2.226	1.000	.000
1.300	.790	.946	.182	2.800	2.276	1.000	.000
1.350	.837	.954	.158	2.850	2.326	1.000	.000
1.400	.885	.961	.137	2.900	2.376	1.000	.000
1.450	.933	.968	.118	2.950	2.426	1.000	.000
				3.000	2.476	1.000	.000

(24) $n = 4$ and $m = 2$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.753	1.500	1.054	0.984	0.064
.050	.002	.085	1.654	1.550	1.104	.987	.053
.100	.008	.165	1.554	1.600	1.153	.989	.044
.150	.019	.241	1.457	1.650	1.203	.992	.037
.200	.032	.311	1.361	1.700	1.252	.993	.030
.250	.050	.377	1.267	1.750	1.302	.995	.025
.300	.070	.438	1.177	1.800	1.352	.996	.020
.350	.093	.494	1.089	1.850	1.401	.997	.016
.400	.119	.547	1.004	1.900	1.451	.997	.013
.450	.148	.595	.924	1.950	1.501	.998	.010
.500	.179	.639	.846	2.000	1.551	.998	.008
.550	.212	.680	.773	2.050	1.601	.999	.007
.600	.247	.717	.704	2.100	1.651	.999	.005
.650	.283	.750	.638	2.150	1.701	.999	.004
.700	.322	.780	.577	2.200	1.751	.999	.003
.750	.361	.808	.519	2.250	1.801	1.000	.002
.800	.402	.832	.465	2.300	1.851	1.000	.002
.850	.445	.854	.416	2.350	1.901	1.000	.001
.900	.488	.874	.370	2.400	1.951	1.000	.001
.950	.532	.891	.327	2.450	2.001	1.000	.001
1.000	.577	.907	.289	2.500	2.051	1.000	.001
1.050	.623	.920	.253	2.550	2.101	1.000	.000
1.100	.669	.932	.222	2.600	2.151	1.000	.000
1.150	.716	.943	.193	2.650	2.201	1.000	.000
1.200	.763	.952	.167	2.700	2.251	1.000	.000
1.250	.811	.959	.144	2.750	2.301	1.000	.000
1.300	.859	.966	.123	2.800	2.351	1.000	.000
1.350	.908	.972	.105	2.850	2.401	1.000	.000
1.400	.956	.977	.089	2.900	2.451	1.000	.000
1.450	1.005	.981	.076	2.950	2.501	1.000	.000
				3.000	2.551	1.000	.000

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(25) $n = 4$ and $m = 4$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	2.406	1.500	1.157	0.996	0.021
.050	.003	.115	2.206	1.550	1.207	.997	.017
.100	.011	.221	2.010	1.600	1.256	.997	.013
.150	.025	.316	1.821	1.650	1.306	.998	.010
.200	.043	.403	1.640	1.700	1.356	.998	.008
.250	.065	.481	1.469	1.750	1.406	.999	.006
.300	.091	.550	1.309	1.800	1.456	.999	.005
.350	.120	.612	1.160	1.850	1.506	.999	.004
.400	.152	.666	1.024	1.900	1.556	.999	.003
.450	.186	.714	.899	1.950	1.606	1.000	.002
.500	.223	.756	.786	2.000	1.656	1.000	.002
.550	.262	.793	.684	2.050	1.706	1.000	.001
.600	.302	.825	.592	2.100	1.756	1.000	.001
.650	.344	.852	.511	2.150	1.806	1.000	.001
.700	.388	.876	.439	2.200	1.856	1.000	.001
.750	.432	.896	.375	2.250	1.906	1.000	.000
.800	.477	.914	.319	2.300	1.956	1.000	.000
.850	.523	.928	.271	2.350	2.006	1.000	.000
.900	.570	.941	.228	2.400	2.056	1.000	.000
.950	.617	.951	.192	2.450	2.106	1.000	.000
1.000	.665	.960	.161	2.500	2.156	1.000	.000
1.050	.713	.967	.134	2.550	2.206	1.000	.000
1.100	.762	.974	.111	2.600	2.256	1.000	.000
1.150	.811	.979	.092	2.650	2.306	1.000	.000
1.200	.860	.983	.075	2.700	2.356	1.000	.000
1.250	.909	.986	.062	2.750	2.406	1.000	.000
1.300	.958	.989	.050	2.800	2.456	1.000	.000
1.350	1.008	.991	.041	2.850	2.506	1.000	.000
1.400	1.057	.993	.033	2.900	2.556	1.000	.000
1.450	1.107	.995	.026	2.950	2.606	1.000	.000
				3.000	2.656	1.000	.000

(26) $n = 4$ and $m = 6$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	2.971	1.500	1.228	1.001	-0.001
.050	.004	.141	2.673	1.550	1.278	1.001	-.001
.100	.014	.267	2.381	1.600	1.328	1.001	-.002
.150	.030	.379	2.103	1.650	1.378	1.001	-.002
.200	.052	.478	1.841	1.700	1.428	1.001	-.002
.250	.078	.564	1.599	1.750	1.478	1.001	-.002
.300	.108	.638	1.378	1.800	1.528	1.000	-.002
.350	.141	.702	1.179	1.850	1.578	1.000	-.002
.400	.178	.756	1.000	1.900	1.628	1.000	-.001
.450	.217	.802	.843	1.950	1.678	1.000	-.001
.500	.258	.841	.705	2.000	1.728	1.000	-.001
.550	.301	.873	.585	2.050	1.778	1.000	-.001
.600	.345	.900	.481	2.100	1.828	1.000	-.001
.650	.391	.922	.393	2.150	1.878	1.000	-.001
.700	.437	.939	.318	2.200	1.928	1.000	.000
.750	.485	.954	.255	2.250	1.978	1.000	.000
.800	.533	.965	.203	2.300	2.028	1.000	.000
.850	.581	.974	.160	2.350	2.078	1.000	.000
.900	.630	.981	.124	2.400	2.128	1.000	.000
.950	.679	.987	.096	2.450	2.178	1.000	.000
1.000	.729	.991	.072	2.500	2.228	1.000	.000
1.050	.778	.994	.054	2.550	2.278	1.000	.000
1.100	.828	.996	.040	2.600	2.328	1.000	.000
1.150	.878	.998	.028	2.650	2.378	1.000	.000
1.200	.928	.999	.020	2.700	2.428	1.000	.000
1.250	.978	1.000	.013	2.750	2.478	1.000	.000
1.300	1.028	1.000	.008	2.800	2.528	1.000	.000
1.350	1.078	1.001	.005	2.850	2.578	1.000	.000
1.400	1.128	1.001	.002	2.900	2.628	1.000	.000
1.450	1.178	1.001	.000	2.950	2.678	1.000	.000
				3.000	2.728	1.000	.000

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = \alpha x^m$)

(27) n = 4 and m = 8

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	3.481	1.500	1.282	1.004	-0.013
.050	.004	.184	3.083	1.550	1.332	1.003	-.011
.100	.016	.309	2.698	1.600	1.382	1.002	-.010
.150	.035	.434	2.333	1.650	1.432	1.002	-.008
.200	.059	.542	1.995	1.700	1.482	1.002	-.007
.250	.089	.634	1.687	1.750	1.532	1.001	-.006
.300	.122	.711	1.411	1.800	1.582	1.001	-.005
.350	.160	.776	1.168	1.850	1.632	1.001	-.004
.400	.200	.829	.955	1.900	1.682	1.001	-.003
.450	.242	.872	.773	1.950	1.732	1.001	-.003
.500	.287	.906	.617	2.000	1.782	1.000	-.002
.550	.333	.934	.486	2.050	1.832	1.000	-.002
.600	.380	.955	.377	2.100	1.882	1.000	-.001
.650	.428	.972	.287	2.150	1.932	1.000	-.001
.700	.477	.984	.214	2.200	1.982	1.000	-.001
.750	.527	.994	.155	2.250	2.032	1.000	-.001
.800	.577	1.000	.109	2.300	2.082	1.000	.000
.850	.627	1.005	.073	2.350	2.132	1.000	.000
.900	.677	1.008	.045	2.400	2.182	1.000	.000
.950	.727	1.009	.024	2.450	2.232	1.000	.000
1.000	.778	1.010	.009	2.500	2.282	1.000	.000
1.050	.828	1.010	-.002	2.550	2.332	1.000	.000
1.100	.879	1.010	-.009	2.600	2.382	1.000	.000
1.150	.929	1.009	-.014	2.650	2.432	1.000	.000
1.200	.980	1.009	-.017	2.700	2.482	1.000	.000
1.250	1.030	1.008	-.018	2.750	2.532	1.000	.000
1.300	1.081	1.007	-.018	2.800	2.582	1.000	.000
1.350	1.131	1.006	-.017	2.850	2.632	1.000	.000
1.400	1.181	1.005	-.016	2.900	2.682	1.000	.000
1.450	1.231	1.004	-.014	2.950	2.732	1.000	.000
				3.000	2.782	1.000	.000

(28) n = 4 and m = 10

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	3.952	1.500	1.324	1.005	-0.020
.050	.005	.185	3.455	1.550	1.374	1.004	-.017
.100	.018	.346	2.975	1.600	1.425	1.003	-.014
.150	.039	.483	2.526	1.650	1.475	1.003	-.012
.200	.066	.599	2.115	1.700	1.525	1.002	-.010
.250	.098	.695	1.746	1.750	1.575	1.002	-.008
.300	.135	.774	1.421	1.800	1.625	1.001	-.006
.350	.176	.838	1.139	1.850	1.675	1.001	-.005
.400	.219	.889	.898	1.900	1.725	1.001	-.004
.450	.264	.929	.696	1.950	1.775	1.001	-.003
.500	.312	.959	.528	2.000	1.825	1.000	-.003
.550	.360	.982	.390	2.050	1.875	1.000	-.002
.600	.410	.998	.279	2.100	1.925	1.000	-.002
.650	.460	1.010	.191	2.150	1.975	1.000	-.001
.700	.511	1.018	.123	2.200	2.025	1.000	-.001
.750	.562	1.023	.070	2.250	2.075	1.000	-.001
.800	.613	1.025	.031	2.300	2.125	1.000	-.001
.850	.664	1.026	.003	2.350	2.175	1.000	.000
.900	.715	1.026	-.017	2.400	2.225	1.000	.000
.950	.767	1.024	-.031	2.450	2.275	1.000	.000
1.000	.818	1.023	-.039	2.500	2.325	1.000	.000
1.050	.869	1.021	-.043	2.550	2.375	1.000	.000
1.100	.920	1.018	-.044	2.600	2.425	1.000	.000
1.150	.971	1.016	-.043	2.650	2.475	1.000	.000
1.200	1.022	1.014	-.041	2.700	2.525	1.000	.000
1.250	1.072	1.012	-.038	2.750	2.575	1.000	.000
1.300	1.123	1.010	-.034	2.800	2.625	1.000	.000
1.350	1.173	1.009	-.031	2.850	2.675	1.000	.000
1.400	1.224	1.007	-.027	2.900	2.725	1.000	.000
1.450	1.274	1.006	-.023	2.950	2.775	1.000	.000
				3.000	2.825	1.000	.000

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(29) $n = 6$ and $m = 0$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.118	1.500	0.975	0.985	0.075
.050	.001	.056	1.117	1.550	1.025	.988	.060
.100	.006	.112	1.116	1.600	1.074	.991	.048
.150	.013	.167	1.112	1.650	1.124	.993	.038
.200	.022	.223	1.104	1.700	1.173	.995	.030
.250	.035	.278	1.092	1.750	1.223	.996	.023
.300	.050	.332	1.074	1.800	1.273	.997	.018
.350	.068	.385	1.052	1.850	1.323	.998	.014
.400	.089	.437	1.023	1.900	1.373	.998	.010
.450	.112	.487	.989	1.950	1.423	.999	.008
.500	.137	.536	.949	2.000	1.473	.999	.006
.550	.165	.582	.904	2.050	1.523	.999	.004
.600	.195	.626	.855	2.100	1.573	1.000	.003
.650	.228	.668	.803	2.150	1.623	1.000	.002
.700	.262	.706	.747	2.200	1.673	1.000	.002
.750	.298	.742	.690	2.250	1.723	1.000	.001
.800	.336	.775	.632	2.300	1.773	1.000	.001
.850	.376	.806	.574	2.350	1.823	1.000	.001
.900	.417	.833	.517	2.400	1.873	1.000	.000
.950	.459	.857	.462	2.450	1.923	1.000	.000
1.000	.503	.879	.409	2.500	1.973	1.000	.000
1.050	.547	.898	.359	2.550	2.023	1.000	.000
1.100	.592	.915	.312	2.600	2.073	1.000	.000
1.150	.638	.930	.270	2.650	2.123	1.000	.000
1.200	.685	.942	.231	2.700	2.173	1.000	.000
1.250	.733	.953	.195	2.750	2.223	1.000	.000
1.300	.780	.962	.164	2.800	2.273	1.000	.000
1.350	.829	.969	.137	2.850	2.323	1.000	.000
1.400	.877	.975	.113	2.900	2.373	1.000	.000
1.450	.926	.980	.093	2.950	2.423	1.000	.000
				3.000	2.473	1.000	.000

(30) $n = 6$ and $m = 1$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.491	1.500	1.038	0.990	0.052
.050	.002	.073	1.441	1.550	1.088	.992	.041
.100	.007	.144	1.390	1.600	1.137	.994	.033
.150	.016	.212	1.338	1.650	1.187	.995	.025
.200	.028	.278	1.284	1.700	1.237	.997	.020
.250	.044	.341	1.228	1.750	1.287	.997	.015
.300	.063	.401	1.170	1.800	1.337	.998	.012
.350	.084	.458	1.110	1.850	1.387	.999	.009
.400	.108	.512	1.048	1.900	1.436	.999	.007
.450	.135	.562	.984	1.950	1.486	.999	.005
.500	.164	.610	.919	2.000	1.536	.999	.004
.550	.196	.654	.853	2.050	1.586	1.000	.003
.600	.230	.695	.787	2.100	1.636	1.000	.002
.650	.266	.733	.721	2.150	1.686	1.000	.001
.700	.303	.767	.656	2.200	1.736	1.000	.001
.750	.342	.799	.593	2.250	1.786	1.000	.001
.800	.383	.827	.533	2.300	1.836	1.000	.000
.850	.425	.852	.475	2.350	1.886	1.000	.000
.900	.468	.874	.420	2.400	1.936	1.000	.000
.950	.512	.894	.368	2.450	1.986	1.000	.000
1.000	.557	.911	.321	2.500	2.036	1.000	.000
1.050	.603	.926	.277	2.550	2.086	1.000	.000
1.100	.650	.939	.238	2.600	2.136	1.000	.000
1.150	.697	.950	.202	2.650	2.186	1.000	.000
1.200	.745	.959	.170	2.700	2.236	1.000	.000
1.250	.793	.967	.143	2.750	2.286	1.000	.000
1.300	.842	.974	.118	2.800	2.336	1.000	.000
1.350	.890	.979	.097	2.850	2.386	1.000	.000
1.400	.939	.983	.080	2.900	2.436	1.000	.000
1.450	.989	.987	.064	2.950	2.486	1.000	.000
				3.000	2.536	1.000	.000

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(31) n = 6 and m = 2

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.826	1.500	1.088	0.993	0.036
.050	.002	.089	1.726	1.550	1.137	.995	.028
.100	.009	.173	1.627	1.600	1.187	.996	.022
.150	.019	.251	1.528	1.650	1.237	.997	.017
.200	.034	.325	1.430	1.700	1.287	.998	.013
.250	.052	.394	1.333	1.750	1.337	.998	.010
.300	.073	.459	1.238	1.800	1.387	.999	.008
.350	.098	.518	1.145	1.850	1.437	.999	.006
.400	.125	.573	1.054	1.900	1.487	.999	.004
.450	.155	.624	.966	1.950	1.537	1.000	.003
.500	.187	.670	.880	2.000	1.587	1.000	.002
.550	.222	.712	.798	2.050	1.637	1.000	.002
.600	.258	.750	.720	2.100	1.687	1.000	.001
.650	.297	.784	.646	2.150	1.737	1.000	.001
.700	.337	.814	.576	2.200	1.787	1.000	.001
.750	.378	.842	.510	2.250	1.837	1.000	.000
.800	.421	.865	.449	2.300	1.887	1.000	.000
.850	.465	.887	.393	2.350	1.937	1.000	.000
.900	.509	.905	.341	2.400	1.987	1.000	.000
.950	.555	.921	.293	2.450	2.037	1.000	.000
1.000	.601	.934	.252	2.500	2.087	1.000	.000
1.050	.648	.946	.215	2.550	2.137	1.000	.000
1.100	.696	.956	.181	2.600	2.187	1.000	.000
1.150	.744	.964	.152	2.650	2.237	1.000	.000
1.200	.792	.971	.126	2.700	2.287	1.000	.000
1.250	.841	.977	.104	2.750	2.337	1.000	.000
1.300	.890	.982	.086	2.800	2.387	1.000	.000
1.350	.939	.986	.070	2.850	2.437	1.000	.000
1.400	.989	.989	.056	2.900	2.487	1.000	.000
1.450	1.038	.991	.045	2.950	2.537	1.000	.000
				3.000	2.587	1.000	.000

(32) n = 6 and m = 4

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	2.417	1.500	1.163	0.997	0.016
.050	.003	.116	2.218	1.550	1.212	.998	.012
.100	.011	.222	2.022	1.600	1.262	.998	.010
.150	.025	.318	1.833	1.650	1.312	.999	.007
.200	.043	.405	1.651	1.700	1.362	.999	.005
.250	.065	.483	1.480	1.750	1.412	.999	.004
.300	.091	.553	1.319	1.800	1.462	1.000	.003
.350	.121	.616	1.170	1.850	1.512	1.000	.002
.400	.153	.671	1.033	1.900	1.562	1.000	.002
.450	.188	.719	.907	1.950	1.612	1.000	.001
.500	.225	.762	.792	2.000	1.662	1.000	.001
.550	.264	.799	.689	2.050	1.712	1.000	.001
.600	.304	.831	.596	2.100	1.762	1.000	.000
.650	.347	.858	.513	2.150	1.812	1.000	.000
.700	.390	.882	.439	2.200	1.862	1.000	.000
.750	.435	.902	.374	2.250	1.912	1.000	.000
.800	.480	.920	.316	2.300	1.962	1.000	.000
.850	.527	.934	.266	2.350	2.012	1.000	.000
.900	.574	.946	.223	2.400	2.062	1.000	.000
.950	.621	.956	.186	2.450	2.112	1.000	.000
1.000	.669	.965	.154	2.500	2.162	1.000	.000
1.050	.718	.972	.126	2.550	2.212	1.000	.000
1.100	.766	.978	.103	2.600	2.262	1.000	.000
1.150	.815	.982	.084	2.650	2.312	1.000	.000
1.200	.865	.986	.068	2.700	2.362	1.000	.000
1.250	.914	.989	.054	2.750	2.412	1.000	.000
1.300	.964	.992	.043	2.800	2.462	1.000	.000
1.350	1.013	.994	.034	2.850	2.512	1.000	.000
1.400	1.063	.995	.027	2.900	2.562	1.000	.000
1.450	1.113	.996	.021	2.950	2.612	1.000	.000
				3.000	2.662	1.000	.000

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(33) $n = 6$ and $m = 6$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	2.938	1.500	1.217	0.999	0.006
.050	.004	.139	2.640	1.550	1.267	.999	.004
.100	.014	.264	2.349	1.600	1.317	1.000	.003
.150	.030	.375	2.072	1.650	1.367	1.000	.002
.200	.051	.472	1.813	1.700	1.417	1.000	.002
.250	.077	.556	1.574	1.750	1.467	1.000	.001
.300	.106	.629	1.356	1.800	1.517	1.000	.001
.350	.139	.692	1.161	1.850	1.567	1.000	.001
.400	.175	.746	.987	1.900	1.617	1.000	.000
.450	.214	.791	.834	1.950	1.667	1.000	.000
.500	.254	.829	.700	2.000	1.717	1.000	.000
.550	.297	.861	.584	2.050	1.767	1.000	.000
.600	.340	.888	.484	2.100	1.817	1.000	.000
.650	.385	.910	.399	2.150	1.867	1.000	.000
.700	.431	.928	.327	2.200	1.917	1.000	.000
.750	.478	.943	.266	2.250	1.967	1.000	.000
.800	.526	.955	.215	2.300	2.017	1.000	.000
.850	.574	.965	.173	2.350	2.067	1.000	.000
.900	.622	.972	.138	2.400	2.117	1.000	.000
.950	.671	.979	.110	2.450	2.167	1.000	.000
1.000	.720	.983	.087	2.500	2.217	1.000	.000
1.050	.769	.987	.068	2.550	2.267	1.000	.000
1.100	.819	.990	.053	2.600	2.317	1.000	.000
1.150	.868	.993	.041	2.650	2.367	1.000	.000
1.200	.918	.994	.032	2.700	2.417	1.000	.000
1.250	.968	.996	.024	2.750	2.467	1.000	.000
1.300	1.018	.997	.018	2.800	2.517	1.000	.000
1.350	1.067	.998	.014	2.850	2.567	1.000	.000
1.400	1.117	.998	.010	2.900	2.617	1.000	.000
1.450	1.167	.999	.008	2.950	2.667	1.000	.000
				3.000	2.717	1.000	.000

(34) $n = 6$ and $m = 8$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	3.412	1.500	1.260	1.000	0.000
.050	.004	.161	3.014	1.550	1.310	1.000	.000
.100	.016	.302	2.630	1.600	1.360	1.000	.000
.150	.034	.424	2.268	1.650	1.410	1.000	.000
.200	.058	.529	1.935	1.700	1.460	1.000	.000
.250	.087	.618	1.634	1.750	1.510	1.000	.000
.300	.119	.693	1.366	1.800	1.560	1.000	.000
.350	.156	.755	1.131	1.850	1.610	1.000	.000
.400	.195	.806	.928	1.900	1.660	1.000	.000
.450	.236	.848	.755	1.950	1.710	1.000	.000
.500	.279	.882	.608	2.000	1.760	1.000	.000
.550	.324	.910	.485	2.050	1.810	1.000	.000
.600	.370	.931	.384	2.100	1.860	1.000	.000
.650	.417	.948	.300	2.150	1.910	1.000	.000
.700	.465	.962	.233	2.200	1.960	1.000	.000
.750	.513	.972	.178	2.250	2.010	1.000	.000
.800	.562	.980	.135	2.300	2.060	1.000	.000
.850	.611	.985	.101	2.350	2.110	1.000	.000
.900	.661	.990	.075	2.400	2.160	1.000	.000
.950	.710	.993	.055	2.450	2.210	1.000	.000
1.000	.760	.995	.039	2.500	2.260	1.000	.000
1.050	.810	.997	.028	2.550	2.310	1.000	.000
1.100	.860	.998	.019	2.600	2.360	1.000	.000
1.150	.910	.999	.013	2.650	2.410	1.000	.000
1.200	.960	.999	.008	2.700	2.460	1.000	.000
1.250	1.010	1.000	.005	2.750	2.510	1.000	.000
1.300	1.060	1.000	.003	2.800	2.560	1.000	.000
1.350	1.110	1.000	.002	2.850	2.610	1.000	.000
1.400	1.160	1.000	.001	2.900	2.660	1.000	.000
1.450	1.210	1.000	.000	2.950	2.710	1.000	.000
				3.000	2.760	1.000	.000

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TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(35) n = 6 and m = 10

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	3.850	1.500	1.294	1.001	-0.004
.050	.005	.180	3.354	1.550	1.344	1.001	-.003
.100	.018	.336	2.877	1.600	1.394	1.000	-.002
.150	.038	.468	2.432	1.650	1.444	1.000	-.002
.200	.064	.580	2.029	1.700	1.494	1.000	-.002
.250	.095	.672	1.670	1.750	1.544	1.000	-.001
.300	.131	.747	1.358	1.800	1.594	1.000	-.001
.350	.170	.808	1.089	1.850	1.644	1.000	-.001
.400	.212	.857	.863	1.900	1.694	1.000	.000
.450	.255	.895	.674	1.950	1.744	1.000	.000
.500	.301	.925	.519	2.000	1.794	1.000	.000
.550	.348	.948	.394	2.050	1.844	1.000	.000
.600	.396	.965	.294	2.100	1.894	1.000	.000
.650	.444	.977	.215	2.150	1.944	1.000	.000
.700	.493	.987	.153	2.200	1.994	1.000	.000
.750	.543	.993	.106	2.250	2.044	1.000	.000
.800	.593	.997	.071	2.300	2.094	1.000	.000
.850	.643	1.000	.045	2.350	2.144	1.000	.000
.900	.693	1.002	.026	2.400	2.194	1.000	.000
.950	.743	1.003	.013	2.450	2.244	1.000	.000
1.000	.793	1.003	.004	2.500	2.294	1.000	.000
1.050	.843	1.003	-.002	2.550	2.344	1.000	.000
1.100	.893	1.003	-.005	2.600	2.394	1.000	.000
1.150	.943	1.003	-.007	2.650	2.444	1.000	.000
1.200	.994	1.003	-.007	2.700	2.494	1.000	.000
1.250	1.044	1.002	-.007	2.750	2.544	1.000	.000
1.300	1.094	1.002	-.007	2.800	2.594	1.000	.000
1.350	1.144	1.002	-.006	2.850	2.644	1.000	.000
1.400	1.194	1.001	-.005	2.900	2.694	1.000	.000
1.450	1.244	1.001	-.005	2.950	2.744	1.000	.000
				3.000	2.794	1.000	.000

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CJ-6

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(36) n = 8 and m = 0

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.271	1.000	0.551	0.926	0.319	2.000	1.536	1.000	0.001
.025	.000	.032	1.271	1.025	.574	.933	.292	2.025	1.561	1.000	.001
.050	.002	.064	1.271	1.050	.598	.940	.267	2.050	1.586	1.000	.001
.075	.004	.095	1.270	1.075	.621	.947	.244	2.075	1.611	1.000	.001
.100	.006	.127	1.268	1.100	.645	.953	.222	2.100	1.636	1.000	.001
.125	.010	.159	1.265	1.125	.669	.958	.201	2.125	1.661	1.000	.000
.150	.014	.190	1.261	1.150	.693	.963	.182	2.150	1.686	1.000	.000
.175	.019	.222	1.256	1.175	.717	.967	.164	2.175	1.711	1.000	.000
.200	.025	.253	1.248	1.200	.741	.971	.148	2.200	1.736	1.000	.000
.225	.032	.284	1.239	1.225	.765	.974	.132	2.225	1.761	1.000	.000
.250	.040	.315	1.229	1.250	.790	.978	.118	2.250	1.786	1.000	.000
.275	.048	.346	1.216	1.275	.814	.980	.106	2.275	1.811	1.000	.000
.300	.057	.376	1.201	1.300	.839	.983	.094	2.300	1.836	1.000	.000
.325	.067	.406	1.184	1.325	.863	.985	.083	2.325	1.861	1.000	.000
.350	.077	.435	1.165	1.350	.888	.987	.074	2.350	1.886	1.000	.000
.375	.088	.464	1.143	1.375	.913	.989	.065	2.375	1.911	1.000	.000
.400	.100	.492	1.120	1.400	.938	.990	.057	2.400	1.936	1.000	.000
.425	.113	.520	1.095	1.425	.962	.992	.050	2.425	1.961	1.000	.000
.450	.126	.547	1.067	1.450	.987	.993	.044	2.450	1.986	1.000	.000
.475	.140	.573	1.038	1.475	1.012	.994	.038	2.475	2.011	1.000	.000
.500	.155	.599	1.008	1.500	1.037	.995	.033	2.500	2.036	1.000	.000
.525	.170	.624	.976	1.525	1.062	.995	.029	2.525	2.061	1.000	.000
.550	.186	.647	.942	1.550	1.087	.996	.025	2.550	2.086	1.000	.000
.575	.203	.671	.908	1.575	1.111	.997	.022	2.575	2.111	1.000	.000
.600	.220	.693	.872	1.600	1.136	.997	.018	2.600	2.136	1.000	.000
.625	.237	.714	.836	1.625	1.161	.998	.016	2.625	2.161	1.000	.000
.650	.255	.735	.799	1.650	1.186	.998	.014	2.650	2.186	1.000	.000
.675	.274	.754	.761	1.675	1.211	.998	.012	2.675	2.211	1.000	.000
.700	.293	.773	.724	1.700	1.236	.999	.010	2.700	2.236	1.000	.000
.725	.313	.790	.686	1.725	1.261	.999	.008	2.725	2.261	1.000	.000
.750	.333	.807	.649	1.750	1.286	.999	.007	2.750	2.286	1.000	.000
.775	.353	.823	.612	1.775	1.311	.999	.006	2.775	2.311	1.000	.000
.800	.374	.838	.575	1.800	1.336	.999	.005	2.800	2.336	1.000	.000
.825	.395	.852	.540	1.825	1.361	.999	.004	2.825	2.361	1.000	.000
.850	.416	.865	.505	1.850	1.386	1.000	.004	2.850	2.386	1.000	.000
.875	.438	.877	.471	1.875	1.411	1.000	.003	2.875	2.411	1.000	.000
.900	.460	.888	.438	1.900	1.436	1.000	.002	2.900	2.436	1.000	.000
.925	.482	.899	.406	1.925	1.461	1.000	.002	2.925	2.461	1.000	.000
.950	.505	.908	.376	1.950	1.486	1.000	.002	2.950	2.486	1.000	.000
.975	.528	.917	.347	1.975	1.511	1.000	.001	2.975	2.511	1.000	.000
								3.000	2.536	1.000	.000

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TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(37) n = 8 and m = 1

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.604	1.000	0.592	0.943	0.256	2.000	1.581	1.000	0.001
.025	.000	.040	1.579	1.025	.615	.949	.233	2.025	1.606	1.000	.001
.050	.002	.079	1.553	1.050	.639	.955	.212	2.050	1.631	1.000	.001
.075	.004	.117	1.528	1.075	.663	.960	.192	2.075	1.656	1.000	.000
.100	.008	.155	1.502	1.100	.687	.964	.174	2.100	1.681	1.000	.000
.125	.012	.193	1.475	1.125	.711	.968	.157	2.125	1.706	1.000	.000
.150	.017	.229	1.447	1.150	.735	.972	.141	2.150	1.731	1.000	.000
.175	.024	.265	1.419	1.175	.760	.975	.127	2.175	1.756	1.000	.000
.200	.031	.300	1.389	1.200	.784	.978	.113	2.200	1.781	1.000	.000
.225	.039	.334	1.358	1.225	.809	.981	.101	2.225	1.806	1.000	.000
.250	.047	.368	1.327	1.250	.833	.983	.090	2.250	1.831	1.000	.000
.275	.057	.401	1.294	1.275	.858	.986	.080	2.275	1.856	1.000	.000
.300	.067	.433	1.260	1.300	.883	.987	.071	2.300	1.881	1.000	.000
.325	.079	.464	1.225	1.325	.907	.989	.062	2.325	1.906	1.000	.000
.350	.091	.494	1.189	1.350	.932	.991	.055	2.350	1.931	1.000	.000
.375	.103	.523	1.153	1.375	.957	.992	.048	2.375	1.956	1.000	.000
.400	.117	.551	1.115	1.400	.982	.993	.042	2.400	1.981	1.000	.000
.425	.131	.579	1.076	1.425	1.006	.994	.037	2.425	2.006	1.000	.000
.450	.146	.605	1.037	1.450	1.031	.995	.032	2.450	2.031	1.000	.000
.475	.161	.631	.997	1.475	1.056	.996	.028	2.475	2.056	1.000	.000
.500	.177	.655	.957	1.500	1.081	.996	.024	2.500	2.081	1.000	.000
.525	.194	.679	.916	1.525	1.106	.997	.021	2.525	2.106	1.000	.000
.550	.211	.701	.875	1.550	1.131	.997	.018	2.550	2.131	1.000	.000
.575	.229	.722	.834	1.575	1.156	.998	.015	2.575	2.156	1.000	.000
.600	.247	.743	.794	1.600	1.181	.998	.013	2.600	2.181	1.000	.000
.625	.266	.762	.753	1.625	1.206	.998	.011	2.625	2.206	1.000	.000
.650	.285	.780	.713	1.650	1.231	.999	.010	2.650	2.231	1.000	.000
.675	.305	.798	.674	1.675	1.256	.999	.008	2.675	2.256	1.000	.000
.700	.325	.814	.635	1.700	1.281	.999	.007	2.700	2.281	1.000	.000
.725	.346	.829	.597	1.725	1.306	.999	.006	2.725	2.306	1.000	.000
.750	.367	.844	.560	1.750	1.331	.999	.005	2.750	2.331	1.000	.000
.775	.388	.857	.523	1.775	1.356	.999	.004	2.775	2.356	1.000	.000
.800	.410	.870	.488	1.800	1.381	1.000	.003	2.800	2.381	1.000	.000
.825	.431	.882	.454	1.825	1.406	1.000	.003	2.825	2.406	1.000	.000
.850	.454	.893	.422	1.850	1.431	1.000	.002	2.850	2.431	1.000	.000
.875	.476	.903	.391	1.875	1.456	1.000	.002	2.875	2.456	1.000	.000
.900	.499	.912	.361	1.900	1.481	1.000	.002	2.900	2.481	1.000	.000
.925	.522	.921	.332	1.925	1.506	1.000	.001	2.925	2.506	1.000	.000
.950	.545	.929	.305	1.950	1.531	1.000	.001	2.950	2.531	1.000	.000
.975	.568	.936	.280	1.975	1.556	1.000	.001	2.975	2.556	1.000	.000
								3.000	2.581	1.000	.000

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CJ-6 back

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(38) $n = 8$ and $m = 2$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.908	1.000	0.626	0.956	0.206	2.000	1.617	1.000	0.001
.025	.001	.047	1.858	1.025	.650	.961	.187	2.025	1.642	1.000	.000
.050	.002	.093	1.807	1.050	.674	.965	.169	2.050	1.667	1.000	.000
.075	.005	.137	1.757	1.075	.698	.969	.152	2.075	1.692	1.000	.000
.100	.009	.181	1.707	1.100	.722	.973	.137	2.100	1.717	1.000	.000
.125	.014	.223	1.657	1.125	.746	.976	.123	2.125	1.742	1.000	.000
.150	.020	.264	1.606	1.150	.771	.979	.110	2.150	1.767	1.000	.000
.175	.027	.303	1.556	1.175	.795	.982	.098	2.175	1.792	1.000	.000
.200	.035	.341	1.505	1.200	.820	.984	.087	2.200	1.817	1.000	.000
.225	.044	.378	1.454	1.225	.845	.986	.077	2.225	1.842	1.000	.000
.250	.054	.414	1.403	1.250	.869	.988	.069	2.250	1.867	1.000	.000
.275	.065	.449	1.352	1.275	.894	.989	.061	2.275	1.892	1.000	.000
.300	.077	.482	1.302	1.300	.919	.991	.053	2.300	1.917	1.000	.000
.325	.089	.514	1.251	1.325	.943	.992	.047	2.325	1.942	1.000	.000
.350	.102	.544	1.200	1.350	.968	.993	.041	2.350	1.967	1.000	.000
.375	.116	.574	1.150	1.375	.993	.994	.036	2.375	1.992	1.000	.000
.400	.131	.602	1.100	1.400	1.018	.995	.031	2.400	2.017	1.000	.000
.425	.147	.629	1.050	1.425	1.043	.996	.027	2.425	2.042	1.000	.000
.450	.163	.654	1.001	1.450	1.068	.996	.024	2.450	2.067	1.000	.000
.475	.179	.679	.953	1.475	1.093	.997	.020	2.475	2.092	1.000	.000
.500	.196	.702	.905	1.500	1.118	.997	.018	2.500	2.117	1.000	.000
.525	.214	.724	.858	1.525	1.143	.998	.015	2.525	2.142	1.000	.000
.550	.233	.745	.811	1.550	1.168	.998	.013	2.550	2.167	1.000	.000
.575	.252	.765	.766	1.575	1.192	.998	.011	2.575	2.192	1.000	.000
.600	.271	.783	.722	1.600	1.217	.999	.009	2.600	2.217	1.000	.000
.625	.291	.801	.679	1.625	1.242	.999	.008	2.625	2.242	1.000	.000
.650	.311	.817	.637	1.650	1.267	.999	.007	2.650	2.267	1.000	.000
.675	.332	.832	.597	1.675	1.292	.999	.006	2.675	2.292	1.000	.000
.700	.353	.847	.557	1.700	1.317	.999	.005	2.700	2.317	1.000	.000
.725	.374	.860	.520	1.725	1.342	.999	.004	2.725	2.342	1.000	.000
.750	.396	.873	.483	1.750	1.367	1.000	.003	2.750	2.367	1.000	.000
.775	.418	.885	.449	1.775	1.392	1.000	.003	2.775	2.392	1.000	.000
.800	.440	.895	.415	1.800	1.417	1.000	.002	2.800	2.417	1.000	.000
.825	.462	.905	.384	1.825	1.442	1.000	.002	2.825	2.442	1.000	.000
.850	.485	.915	.354	1.850	1.467	1.000	.002	2.850	2.467	1.000	.000
.875	.508	.923	.325	1.875	1.492	1.000	.001	2.875	2.492	1.000	.000
.900	.531	.931	.298	1.900	1.517	1.000	.001	2.900	2.517	1.000	.000
.925	.555	.938	.273	1.925	1.542	1.000	.001	2.925	2.542	1.000	.000
.950	.578	.944	.249	1.950	1.567	1.000	.001	2.950	2.567	1.000	.000
.975	.602	.950	.227	1.975	1.592	1.000	.001	2.975	2.592	1.000	.000
								3.000	2.617	1.000	.000

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TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(39) n = 8 and m = 4

η	$g(\eta)$	$g'(\eta)$	$g''(\eta)$	η	$g(\eta)$	$g'(\eta)$	$g''(\eta)$
0.000	0.000	0.000	2.454	1.000	0.680	0.974	0.153
.025	.001	.060	2.354	1.025	.704	.977	.119
.050	.003	.118	2.254	1.050	.729	.980	.106
.075	.007	.173	2.156	1.075	.753	.982	.095
.100	.012	.225	2.058	1.100	.778	.984	.084
.125	.018	.276	1.962	1.125	.802	.986	.075
.150	.025	.324	1.868	1.150	.827	.988	.066
.175	.034	.369	1.775	1.175	.852	.990	.058
.200	.044	.412	1.689	1.200	.876	.991	.051
.225	.055	.453	1.597	1.225	.901	.992	.045
.250	.066	.492	1.511	1.250	.926	.993	.040
.275	.079	.529	1.428	1.275	.951	.994	.035
.300	.093	.564	1.347	1.300	.976	.995	.030
.325	.107	.596	1.269	1.325	1.001	.996	.026
.350	.123	.627	1.194	1.350	1.026	.996	.023
.375	.139	.656	1.122	1.375	1.050	.997	.020
.400	.155	.683	1.052	1.400	1.075	.997	.017
.425	.173	.709	.985	1.425	1.100	.998	.015
.450	.191	.733	.921	1.450	1.125	.998	.013
.475	.210	.755	.860	1.475	1.150	.998	.011
.500	.229	.776	.802	1.500	1.175	.999	.009
.525	.248	.795	.746	1.525	1.200	.999	.008
.550	.268	.813	.693	1.550	1.225	.999	.007
.575	.289	.830	.643	1.575	1.250	.999	.006
.600	.310	.845	.595	1.600	1.275	.999	.005
.625	.331	.859	.550	1.625	1.300	.999	.004
.650	.353	.873	.507	1.650	1.325	1.000	.003
.675	.375	.885	.467	1.675	1.350	1.000	.003
.700	.397	.896	.429	1.700	1.375	1.000	.002
.725	.420	.906	.394	1.725	1.400	1.000	.002
.750	.442	.916	.360	1.750	1.425	1.000	.002
.775	.465	.924	.329	1.775	1.450	1.000	.001
.800	.489	.932	.300	1.800	1.475	1.000	.001
.825	.512	.939	.273	1.825	1.500	1.000	.001
.850	.536	.946	.248	1.850	1.525	1.000	.001
.875	.559	.952	.225	1.875	1.550	1.000	.001
.900	.583	.957	.203	1.900	1.575	1.000	.001
.925	.607	.962	.184	1.925	1.600	1.000	.000
.950	.631	.966	.165	1.950	1.625	1.000	.000
.975	.655	.970	.149	1.975	1.650	1.000	.000
				2.000	1.675	1.000	.000

(40) n = 8 and m = 8

η	$g(\eta)$	$g'(\eta)$	$g''(\eta)$	η	$g(\eta)$	$g'(\eta)$	$g''(\eta)$
0.000	0.000	0.000	2.942	1.000	0.721	0.985	0.083
.025	.001	.072	2.792	1.025	.746	.987	.073
.050	.004	.140	2.643	1.050	.771	.989	.065
.075	.008	.204	2.496	1.075	.796	.990	.057
.100	.014	.264	2.353	1.100	.820	.992	.050
.125	.021	.322	2.212	1.125	.845	.993	.043
.150	.030	.375	2.076	1.150	.870	.994	.038
.175	.040	.425	1.944	1.175	.895	.995	.033
.200	.051	.472	1.817	1.200	.920	.995	.029
.225	.063	.516	1.695	1.225	.945	.996	.025
.250	.077	.557	1.578	1.250	.969	.997	.022
.275	.091	.595	1.467	1.275	.994	.997	.019
.300	.107	.630	1.361	1.300	1.019	.998	.016
.325	.123	.663	1.260	1.325	1.044	.998	.014
.350	.140	.694	1.165	1.350	1.069	.998	.012
.375	.157	.722	1.076	1.375	1.094	.999	.010
.400	.176	.747	.991	1.400	1.119	.999	.009
.425	.195	.771	.912	1.425	1.144	.999	.007
.450	.214	.793	.837	1.450	1.169	.999	.006
.475	.234	.813	.768	1.475	1.194	.999	.005
.500	.255	.831	.703	1.500	1.219	.999	.004
.525	.276	.848	.642	1.525	1.244	.999	.004
.550	.297	.864	.586	1.550	1.269	1.000	.003
.575	.319	.878	.534	1.575	1.294	1.000	.003
.600	.341	.890	.485	1.600	1.319	1.000	.002
.625	.364	.902	.441	1.625	1.344	1.000	.002
.650	.386	.912	.399	1.650	1.369	1.000	.002
.675	.409	.922	.361	1.675	1.394	1.000	.001
.700	.432	.930	.326	1.700	1.419	1.000	.001
.725	.456	.938	.294	1.725	1.444	1.000	.001
.750	.479	.945	.265	1.750	1.469	1.000	.001
.775	.503	.951	.238	1.775	1.494	1.000	.001
.800	.527	.957	.215	1.800	1.519	1.000	.000
.825	.551	.962	.191	1.825	1.544	1.000	.000
.850	.575	.967	.170	1.850	1.569	1.000	.000
.875	.599	.971	.152	1.875	1.594	1.000	.000
.900	.623	.974	.133	1.900	1.619	1.000	.000
.925	.648	.977	.120	1.925	1.644	1.000	.000
.950	.672	.980	.107	1.950	1.669	1.000	.000
.975	.697	.983	.094	1.975	1.694	1.000	.000
				2.000	1.719	1.000	.000

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(41) n = 8 and m = 8

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	3.388	1.000	0.735	0.993	0.048
.025	.001	.082	3.189	1.025	.780	.994	.041
.050	.004	.159	2.991	1.050	.805	.995	.035
.075	.009	.232	2.797	1.075	.830	.995	.030
.100	.016	.299	2.607	1.100	.855	.996	.026
.125	.024	.362	2.424	1.125	.879	.997	.022
.150	.034	.421	2.247	1.150	.904	.997	.019
.175	.045	.475	2.077	1.175	.929	.998	.016
.200	.057	.524	1.916	1.200	.954	.998	.014
.225	.071	.570	1.763	1.225	.979	.998	.012
.250	.086	.613	1.618	1.250	1.004	.999	.010
.275	.102	.651	1.482	1.275	1.029	.999	.008
.300	.118	.687	1.354	1.300	1.054	.999	.007
.325	.136	.719	1.234	1.325	1.079	.999	.006
.350	.154	.749	1.123	1.350	1.104	.999	.005
.375	.173	.775	1.019	1.375	1.129	.999	.004
.400	.193	.800	.924	1.400	1.154	1.000	.003
.425	.213	.822	.835	1.425	1.179	1.000	.003
.450	.234	.841	.753	1.450	1.204	1.000	.002
.475	.255	.859	.678	1.475	1.229	1.000	.002
.500	.277	.875	.610	1.500	1.254	1.000	.002
.525	.299	.890	.547	1.525	1.279	1.000	.001
.550	.322	.903	.489	1.550	1.304	1.000	.001
.575	.344	.914	.437	1.575	1.329	1.000	.001
.600	.367	.925	.390	1.600	1.354	1.000	.001
.625	.391	.934	.347	1.625	1.379	1.000	.001
.650	.414	.942	.308	1.650	1.404	1.000	.000
.675	.438	.949	.273	1.675	1.429	1.000	.000
.700	.461	.956	.242	1.700	1.454	1.000	.000
.725	.485	.962	.214	1.725	1.479	1.000	.000
.750	.510	.967	.188	1.750	1.504	1.000	.000
.775	.534	.971	.166	1.775	1.529	1.000	.000
.800	.558	.975	.145	1.800	1.554	1.000	.000
.825	.582	.978	.127	1.825	1.579	1.000	.000
.850	.607	.981	.111	1.850	1.604	1.000	.000
.875	.632	.984	.097	1.875	1.629	1.000	.000
.900	.656	.986	.085	1.900	1.654	1.000	.000
.925	.681	.988	.074	1.925	1.679	1.000	.000
.950	.706	.990	.064	1.950	1.704	1.000	.000
.975	.730	.991	.055	1.975	1.729	1.000	.000
				2.000	1.754	1.000	.000

(42) n = 8 and m = 10

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	3.804	1.000	0.783	0.998	0.022
.025	.001	.092	3.554	1.025	.808	.998	.018
.050	.005	.178	3.308	1.050	.833	.999	.014
.075	.010	.257	3.066	1.075	.858	.999	.012
.100	.017	.331	2.832	1.100	.883	.999	.009
.125	.027	.399	2.606	1.125	.908	.999	.007
.150	.037	.461	2.390	1.150	.933	1.000	.006
.175	.050	.519	2.185	1.175	.958	1.000	.005
.200	.063	.571	1.992	1.200	.983	1.000	.004
.225	.078	.618	1.809	1.225	1.008	1.000	.003
.250	.094	.661	1.639	1.250	1.033	1.000	.002
.275	.111	.700	1.480	1.275	1.058	1.000	.002
.300	.129	.736	1.333	1.300	1.083	1.000	.001
.325	.148	.767	1.197	1.325	1.108	1.000	.001
.350	.167	.795	1.072	1.350	1.133	1.000	.001
.375	.188	.821	.958	1.375	1.158	1.000	.000
.400	.208	.843	.853	1.400	1.183	1.000	.000
.425	.230	.864	.758	1.425	1.208	1.000	.000
.450	.252	.881	.671	1.450	1.233	1.000	.000
.475	.274	.897	.593	1.475	1.258	1.000	.000
.500	.296	.911	.522	1.500	1.283	1.000	.000
.525	.319	.923	.459	1.525	1.308	1.000	.000
.550	.343	.934	.402	1.550	1.333	1.000	.000
.575	.366	.944	.351	1.575	1.358	1.000	.000
.600	.390	.952	.306	1.600	1.383	1.000	.000
.625	.414	.959	.266	1.625	1.408	1.000	.000
.650	.438	.965	.230	1.650	1.433	1.000	.000
.675	.462	.970	.199	1.675	1.458	1.000	.000
.700	.486	.975	.171	1.700	1.483	1.000	.000
.725	.511	.979	.147	1.725	1.508	1.000	.000
.750	.535	.982	.126	1.750	1.533	1.000	.000
.775	.560	.985	.107	1.775	1.558	1.000	.000
.800	.584	.988	.091	1.800	1.583	1.000	.000
.825	.609	.990	.077	1.825	1.608	1.000	.000
.850	.634	.992	.065	1.850	1.633	1.000	.000
.875	.659	.993	.055	1.875	1.658	1.000	.000
.900	.684	.994	.046	1.900	1.683	1.000	.000
.925	.708	.995	.038	1.925	1.708	1.000	.000
.950	.733	.996	.032	1.950	1.733	1.000	.000
.975	.758	.997	.026	1.975	1.758	1.000	.000
				2.000	1.783	1.000	.000

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(43) n = 10 and m = 0

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.408	1.000	.589	.954	.239
.025	.000	.035	1.408	1.025	.613	.960	.214
.050	.002	.070	1.407	1.050	.637	.965	.191
.075	.004	.106	1.406	1.075	.661	.969	.171
.100	.007	.141	1.403	1.100	.685	.973	.151
.125	.011	.176	1.399	1.125	.710	.977	.134
.150	.016	.211	1.393	1.150	.734	.980	.118
.175	.022	.245	1.385	1.175	.759	.983	.104
.200	.028	.280	1.374	1.200	.783	.985	.091
.225	.036	.314	1.361	1.225	.808	.987	.079
.250	.044	.348	1.345	1.250	.833	.989	.069
.275	.053	.381	1.327	1.275	.857	.991	.060
.300	.063	.414	1.305	1.300	.882	.992	.052
.325	.074	.447	1.280	1.325	.907	.993	.044
.350	.085	.478	1.253	1.350	.932	.995	.038
.375	.098	.509	1.223	1.375	.957	.995	.033
.400	.111	.539	1.191	1.400	.982	.996	.028
.425	.124	.569	1.155	1.425	1.006	.997	.023
.450	.139	.597	1.118	1.450	1.031	.997	.020
.475	.154	.625	1.079	1.475	1.056	.998	.017
.500	.170	.651	1.037	1.500	1.081	.998	.014
.525	.187	.676	.995	1.525	1.106	.998	.012
.550	.204	.701	.951	1.550	1.131	.999	.010
.575	.222	.724	.906	1.575	1.156	.999	.008
.600	.240	.746	.860	1.600	1.181	.999	.007
.625	.259	.767	.814	1.625	1.206	.999	.006
.650	.279	.787	.768	1.650	1.231	.999	.005
.675	.298	.805	.722	1.675	1.256	1.000	.004
.700	.319	.823	.677	1.700	1.281	1.000	.003
.725	.340	.839	.632	1.725	1.306	1.000	.003
.750	.361	.854	.589	1.750	1.331	1.000	.002
.775	.382	.869	.546	1.775	1.356	1.000	.002
.800	.404	.882	.505	1.800	1.381	1.000	.001
.825	.426	.894	.465	1.825	1.406	1.000	.001
.850	.449	.905	.428	1.850	1.431	1.000	.001
.875	.472	.915	.391	1.875	1.456	1.000	.001
.900	.495	.925	.357	1.900	1.481	1.000	.001
.925	.518	.933	.325	1.925	1.506	1.000	.000
.950	.541	.941	.294	1.950	1.531	1.000	.000
.975	.565	.948	.265	1.975	1.556	1.000	.000
				2.000	1.581	1.000	.000

(44) n = 10 and m = 1

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.710	1.000	0.620	0.964	0.196
.025	.001	.042	1.685	1.025	.644	.968	.175
.050	.002	.084	1.660	1.050	.669	.972	.155
.075	.005	.125	1.634	1.075	.693	.976	.138
.100	.008	.166	1.607	1.100	.717	.979	.122
.125	.013	.206	1.579	1.125	.742	.982	.107
.150	.019	.245	1.550	1.150	.767	.985	.094
.175	.025	.283	1.519	1.175	.791	.987	.082
.200	.033	.321	1.486	1.200	.816	.989	.072
.225	.041	.358	1.452	1.225	.841	.990	.062
.250	.051	.393	1.416	1.250	.865	.992	.054
.275	.061	.428	1.379	1.275	.890	.993	.047
.300	.072	.462	1.339	1.300	.915	.994	.040
.325	.084	.495	1.298	1.325	.940	.995	.034
.350	.097	.527	1.256	1.350	.965	.996	.029
.375	.110	.558	1.212	1.375	.990	.997	.025
.400	.125	.588	1.167	1.400	1.015	.997	.021
.425	.140	.616	1.120	1.425	1.040	.998	.018
.450	.156	.644	1.073	1.450	1.065	.998	.015
.475	.172	.670	1.025	1.475	1.089	.998	.013
.500	.189	.695	.976	1.500	1.114	.999	.011
.525	.207	.719	.927	1.525	1.139	.999	.009
.550	.225	.741	.878	1.550	1.164	.999	.007
.575	.244	.763	.829	1.575	1.189	.999	.006
.600	.263	.783	.781	1.600	1.214	.999	.005
.625	.283	.802	.733	1.625	1.239	1.000	.004
.650	.303	.820	.686	1.650	1.264	1.000	.003
.675	.324	.836	.641	1.675	1.289	1.000	.003
.700	.345	.852	.596	1.700	1.314	1.000	.002
.725	.366	.866	.553	1.725	1.339	1.000	.002
.750	.388	.879	.511	1.750	1.364	1.000	.001
.775	.410	.892	.471	1.775	1.389	1.000	.001
.800	.433	.903	.433	1.800	1.414	1.000	.001
.825	.456	.913	.396	1.825	1.439	1.000	.001
.850	.479	.923	.362	1.850	1.464	1.000	.001
.875	.502	.931	.329	1.875	1.489	1.000	.000
.900	.525	.939	.299	1.900	1.514	1.000	.000
.925	.549	.946	.270	1.925	1.539	1.000	.000
.950	.572	.953	.243	1.950	1.564	1.000	.000
.975	.596	.958	.218	1.975	1.589	1.000	.000
				2.000	1.614	1.000	.000

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(45) n = 10 and m = 2

η	$g(\eta)$	$g'(\eta)$	$g''(\eta)$	η	$g(\eta)$	$g'(\eta)$	$g''(\eta)$
0.000	0.000	0.000	1.991	1.000	0.647	0.971	0.161
.025	.001	.049	1.941	1.025	.672	.975	.143
.050	.002	.097	1.891	1.050	.696	.978	.126
.075	.005	.144	1.840	1.075	.721	.981	.111
.100	.010	.189	1.789	1.100	.745	.984	.098
.125	.015	.233	1.738	1.125	.770	.986	.086
.150	.021	.276	1.686	1.150	.794	.988	.075
.175	.029	.317	1.633	1.175	.819	.990	.065
.200	.037	.358	1.580	1.200	.844	.991	.057
.225	.047	.396	1.526	1.225	.869	.993	.049
.250	.057	.434	1.472	1.250	.894	.994	.042
.275	.068	.470	1.417	1.275	.918	.995	.036
.300	.080	.505	1.362	1.300	.943	.996	.031
.325	.093	.538	1.306	1.325	.968	.996	.027
.350	.107	.570	1.250	1.350	.993	.997	.023
.375	.122	.601	1.194	1.375	1.018	.997	.019
.400	.137	.630	1.138	1.400	1.043	.998	.016
.425	.153	.658	1.082	1.425	1.068	.998	.014
.450	.170	.684	1.026	1.450	1.093	.999	.012
.475	.188	.709	.971	1.475	1.118	.999	.010
.500	.205	.732	.917	1.500	1.143	.999	.008
.525	.224	.755	.864	1.525	1.168	.999	.007
.550	.243	.776	.811	1.550	1.193	.999	.006
.575	.263	.795	.760	1.575	1.218	.999	.005
.600	.283	.814	.710	1.600	1.243	1.000	.004
.625	.304	.831	.661	1.625	1.268	1.000	.003
.650	.325	.847	.614	1.650	1.293	1.000	.003
.675	.346	.861	.569	1.675	1.318	1.000	.002
.700	.368	.875	.526	1.700	1.343	1.000	.002
.725	.390	.888	.484	1.725	1.368	1.000	.001
.750	.412	.899	.445	1.750	1.393	1.000	.001
.775	.435	.910	.407	1.775	1.418	1.000	.001
.800	.458	.920	.372	1.800	1.443	1.000	.001
.825	.481	.929	.338	1.825	1.468	1.000	.001
.850	.504	.937	.307	1.850	1.493	1.000	.000
.875	.528	.944	.278	1.875	1.518	1.000	.000
.900	.551	.951	.251	1.900	1.543	1.000	.000
.925	.575	.957	.225	1.925	1.568	1.000	.000
.950	.599	.962	.202	1.950	1.593	1.000	.000
.975	.623	.967	.180	1.975	1.618	1.000	.000
				2.000	1.643	1.000	.000

(46) n = 10 and m = 4

η	$g(\eta)$	$g'(\eta)$	$g''(\eta)$	η	$g(\eta)$	$g'(\eta)$	$g''(\eta)$
0.000	0.000	0.000	2.502	1.000	0.692	0.981	0.109
.025	.001	.061	2.402	1.025	.716	.984	.095
.050	.003	.120	2.302	1.050	.741	.986	.084
.075	.007	.176	2.203	1.075	.766	.988	.073
.100	.012	.230	2.105	1.100	.790	.990	.064
.125	.018	.282	2.008	1.125	.815	.991	.055
.150	.026	.331	1.913	1.150	.840	.993	.048
.175	.035	.377	1.819	1.175	.865	.994	.041
.200	.045	.422	1.727	1.200	.890	.995	.036
.225	.056	.464	1.637	1.225	.914	.996	.031
.250	.068	.504	1.550	1.250	.939	.996	.026
.275	.081	.541	1.464	1.275	.964	.997	.022
.300	.095	.577	1.381	1.300	.989	.997	.019
.325	.110	.610	1.300	1.325	1.014	.998	.016
.350	.125	.642	1.221	1.350	1.039	.998	.014
.375	.142	.671	1.145	1.375	1.064	.998	.011
.400	.159	.699	1.072	1.400	1.089	.999	.010
.425	.177	.725	1.001	1.425	1.114	.999	.008
.450	.195	.749	.934	1.450	1.139	.999	.007
.475	.214	.772	.869	1.475	1.164	.999	.006
.500	.234	.793	.806	1.500	1.189	.999	.005
.525	.254	.812	.747	1.525	1.214	1.000	.004
.550	.274	.830	.690	1.550	1.239	1.000	.003
.575	.295	.847	.637	1.575	1.264	1.000	.003
.600	.317	.862	.586	1.600	1.289	1.000	.002
.625	.338	.876	.537	1.625	1.314	1.000	.002
.650	.361	.889	.492	1.650	1.339	1.000	.001
.675	.383	.900	.449	1.675	1.364	1.000	.001
.700	.406	.911	.409	1.700	1.389	1.000	.001
.725	.428	.921	.372	1.725	1.414	1.000	.001
.750	.452	.930	.337	1.750	1.439	1.000	.001
.775	.475	.938	.305	1.775	1.464	1.000	.000
.800	.498	.945	.275	1.800	1.489	1.000	.000
.825	.522	.952	.247	1.825	1.514	1.000	.000
.850	.546	.957	.222	1.850	1.539	1.000	.000
.875	.570	.963	.198	1.875	1.564	1.000	.000
.900	.594	.967	.177	1.900	1.589	1.000	.000
.925	.618	.972	.157	1.925	1.614	1.000	.000
.950	.643	.975	.139	1.950	1.639	1.000	.000
.975	.667	.979	.123	1.975	1.664	1.000	.000
				2.000	1.689	1.000	.000

TABLE I. - Continued. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(47) n = 10 and m = 6

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	2.963	1.000	0.727	0.988	0.072
.025	.001	.072	2.813	1.025	.752	.990	.063
.050	.004	.141	2.664	1.050	.776	.992	.054
.075	.008	.205	2.516	1.075	.801	.993	.047
.100	.014	.267	2.374	1.100	.826	.994	.041
.125	.021	.324	2.233	1.125	.851	.995	.035
.150	.030	.378	2.096	1.150	.876	.996	.030
.175	.040	.429	1.964	1.175	.901	.996	.026
.200	.051	.476	1.836	1.200	.926	.997	.022
.225	.064	.521	1.713	1.225	.950	.997	.019
.250	.077	.562	1.596	1.250	.975	.998	.016
.275	.092	.601	1.483	1.275	1.000	.998	.013
.300	.107	.636	1.376	1.300	1.025	.999	.011
.325	.124	.669	1.274	1.325	1.050	.999	.009
.350	.141	.700	1.178	1.350	1.075	.999	.008
.375	.159	.728	1.086	1.375	1.100	.999	.007
.400	.177	.754	1.000	1.400	1.125	.999	.005
.425	.196	.778	.919	1.425	1.150	.999	.005
.450	.216	.800	.843	1.450	1.175	1.000	.004
.475	.236	.821	.772	1.475	1.200	1.000	.003
.500	.257	.839	.705	1.500	1.225	1.000	.003
.525	.278	.856	.643	1.525	1.250	1.000	.002
.550	.300	.871	.585	1.550	1.275	1.000	.002
.575	.322	.885	.531	1.575	1.300	1.000	.001
.600	.344	.898	.481	1.600	1.325	1.000	.001
.625	.367	.909	.435	1.625	1.350	1.000	.001
.650	.390	.920	.392	1.650	1.375	1.000	.001
.675	.413	.929	.353	1.675	1.400	1.000	.001
.700	.436	.937	.317	1.700	1.425	1.000	.000
.725	.460	.945	.284	1.725	1.450	1.000	.000
.750	.483	.952	.254	1.750	1.475	1.000	.000
.775	.507	.958	.226	1.775	1.500	1.000	.000
.800	.531	.963	.201	1.800	1.525	1.000	.000
.825	.555	.968	.179	1.825	1.550	1.000	.000
.850	.580	.972	.158	1.850	1.575	1.000	.000
.875	.604	.976	.140	1.875	1.600	1.000	.000
.900	.628	.979	.123	1.900	1.625	1.000	.000
.925	.653	.982	.108	1.925	1.650	1.000	.000
.950	.677	.984	.095	1.950	1.675	1.000	.000
.975	.702	.986	.083	1.975	1.700	1.000	.000
				2.000	1.725	1.000	.000

(48) n = 10 and m = 8

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	3.388	1.000	0.756	0.993	0.046
.025	.001	.082	3.188	1.025	.781	.994	.039
.050	.004	.159	2.991	1.050	.805	.995	.034
.075	.009	.232	2.796	1.075	.830	.996	.029
.100	.016	.299	2.607	1.100	.855	.997	.024
.125	.024	.362	2.424	1.125	.880	.997	.021
.150	.034	.421	2.247	1.150	.905	.998	.018
.175	.045	.475	2.078	1.175	.930	.998	.015
.200	.057	.525	1.917	1.200	.955	.998	.013
.225	.071	.571	1.764	1.225	.980	.999	.011
.250	.086	.613	1.620	1.250	1.005	.999	.009
.275	.102	.652	1.484	1.275	1.030	.999	.007
.300	.118	.687	1.356	1.300	1.055	.999	.006
.325	.136	.719	1.237	1.325	1.080	.999	.005
.350	.154	.749	1.126	1.350	1.105	.999	.004
.375	.173	.776	1.022	1.375	1.130	1.000	.003
.400	.193	.800	.926	1.400	1.155	1.000	.003
.425	.213	.822	.838	1.425	1.180	1.000	.002
.450	.234	.842	.756	1.450	1.205	1.000	.002
.475	.256	.860	.681	1.475	1.230	1.000	.002
.500	.277	.876	.612	1.500	1.255	1.000	.001
.525	.299	.891	.549	1.525	1.280	1.000	.001
.550	.322	.904	.491	1.550	1.305	1.000	.001
.575	.344	.915	.439	1.575	1.330	1.000	.001
.600	.368	.926	.391	1.600	1.355	1.000	.001
.625	.391	.935	.348	1.625	1.380	1.000	.000
.650	.414	.943	.309	1.650	1.405	1.000	.000
.675	.438	.950	.273	1.675	1.430	1.000	.000
.700	.462	.957	.242	1.700	1.455	1.000	.000
.725	.486	.962	.213	1.725	1.480	1.000	.000
.750	.510	.967	.188	1.750	1.505	1.000	.000
.775	.534	.972	.165	1.775	1.530	1.000	.000
.800	.558	.976	.144	1.800	1.555	1.000	.000
.825	.583	.979	.126	1.825	1.580	1.000	.000
.850	.607	.982	.110	1.850	1.605	1.000	.000
.875	.632	.985	.096	1.875	1.630	1.000	.000
.900	.657	.987	.083	1.900	1.655	1.000	.000
.925	.681	.989	.072	1.925	1.680	1.000	.000
.950	.706	.990	.062	1.950	1.705	1.000	.000
.975	.731	.992	.053	1.975	1.730	1.000	.000
				2.000	1.755	1.000	.000

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TABLE I. - Concluded. NUMERICAL SOLUTION TO CASE I ($U = ax^n$, $W = bx^m$)

(49) $n = 10$ and $m = 10$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	3.785	1.000	0.780	0.996	0.027
.025	.001	.092	3.536	1.025	.805	.997	.022
.050	.005	.177	3.289	1.050	.830	.998	.019
.075	.010	.256	3.048	1.075	.855	.998	.016
.100	.017	.329	2.814	1.100	.880	.998	.013
.125	.026	.397	2.589	1.125	.905	.999	.011
.150	.037	.459	2.374	1.150	.930	.999	.009
.175	.049	.516	2.170	1.175	.955	.999	.007
.200	.063	.567	1.978	1.200	.980	.999	.006
.225	.078	.615	1.797	1.225	1.005	.999	.005
.250	.093	.657	1.629	1.250	1.030	1.000	.004
.275	.110	.696	1.472	1.275	1.055	1.000	.003
.300	.128	.731	1.326	1.300	1.080	1.000	.003
.325	.147	.763	1.192	1.325	1.105	1.000	.002
.350	.166	.791	1.068	1.350	1.130	1.000	.002
.375	.186	.816	.955	1.375	1.155	1.000	.001
.400	.207	.839	.852	1.400	1.180	1.000	.001
.425	.228	.859	.758	1.425	1.205	1.000	.001
.450	.250	.877	.673	1.450	1.230	1.000	.001
.475	.272	.892	.596	1.475	1.255	1.000	.001
.500	.295	.906	.527	1.500	1.280	1.000	.000
.525	.317	.919	.464	1.525	1.305	1.000	.000
.550	.341	.930	.408	1.550	1.330	1.000	.000
.575	.364	.939	.358	1.575	1.355	1.000	.000
.600	.388	.948	.313	1.600	1.380	1.000	.000
.625	.411	.955	.273	1.625	1.405	1.000	.000
.650	.435	.961	.238	1.650	1.430	1.000	.000
.675	.459	.967	.207	1.675	1.455	1.000	.000
.700	.484	.972	.179	1.700	1.480	1.000	.000
.725	.508	.976	.155	1.725	1.505	1.000	.000
.750	.532	.980	.134	1.750	1.530	1.000	.000
.775	.557	.983	.115	1.775	1.555	1.000	.000
.800	.582	.985	.099	1.800	1.580	1.000	.000
.825	.606	.988	.085	1.825	1.605	1.000	.000
.850	.631	.990	.072	1.850	1.630	1.000	.000
.875	.656	.991	.062	1.875	1.655	1.000	.000
.900	.680	.993	.052	1.900	1.680	1.000	.000
.925	.705	.994	.044	1.925	1.705	1.000	.000
.950	.730	.995	.038	1.950	1.730	1.000	.000
.975	.755	.996	.032	1.975	1.755	1.000	.000
				2.000	1.780	1.000	.000

TABLE II. - NUMERICAL SOLUTION TO CASE II ($U = ax^n z^{m-1}$, $W = bx^{n-1}z^m$)

(1) $p = 1$ and $m + n = 1$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	0.575	2.000	1.042	0.909	0.195
.050	.001	.029	.575	2.050	1.088	.918	.178
.100	.003	.058	.575	2.100	1.134	.927	.164
.150	.006	.086	.575	2.150	1.180	.935	.150
.200	.012	.115	.574	2.200	1.227	.942	.137
.250	.018	.144	.574	2.250	1.275	.949	.125
.300	.026	.172	.573	2.300	1.322	.954	.113
.350	.035	.201	.572	2.350	1.370	.960	.102
.400	.046	.230	.570	2.400	1.418	.965	.092
.450	.058	.258	.568	2.450	1.467	.969	.083
.500	.072	.286	.565	2.500	1.515	.973	.074
.550	.087	.314	.562	2.550	1.564	.977	.066
.600	.103	.342	.558	2.600	1.613	.980	.059
.650	.121	.370	.553	2.650	1.662	.982	.052
.700	.140	.398	.548	2.700	1.711	.985	.046
.750	.161	.425	.541	2.750	1.760	.987	.040
.800	.183	.452	.534	2.800	1.810	.989	.035
.850	.206	.478	.527	2.850	1.859	.990	.031
.900	.231	.504	.518	2.900	1.909	.992	.027
.950	.256	.530	.509	2.950	1.958	.993	.023
1.000	.284	.555	.499	3.000	2.008	.994	.020
1.050	.312	.580	.488	3.050	2.058	.995	.017
1.100	.342	.604	.476	3.100	2.108	.996	.015
1.150	.372	.628	.463	3.150	2.157	.997	.012
1.200	.404	.650	.450	3.200	2.207	.997	.011
1.250	.437	.673	.436	3.250	2.257	.998	.009
1.300	.472	.694	.421	3.300	2.307	.998	.007
1.350	.507	.715	.406	3.350	2.357	.998	.006
1.400	.543	.735	.391	3.400	2.407	.999	.005
1.450	.580	.754	.374	3.450	2.457	.999	.004
1.500	.618	.772	.358	3.500	2.507	.999	.004
1.550	.657	.790	.341	3.550	2.557	.999	.003
1.600	.697	.806	.324	3.600	2.607	.999	.002
1.650	.738	.822	.307	3.650	2.657	1.000	.002
1.700	.779	.837	.290	3.700	2.707	1.000	.002
1.750	.822	.851	.273	3.750	2.757	1.000	.001
1.800	.865	.864	.257	3.800	2.807	1.000	.001
1.850	.908	.877	.240	3.850	2.857	1.000	.001
1.900	.952	.888	.224	3.900	2.907	1.000	.001
1.950	.997	.899	.208	3.950	2.957	1.000	.001
				4.000	3.007	1.000	.000

(2) $p = 1$ and $m + n = 2$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.312	2.000	1.433	0.992	0.031
.050	.002	.064	1.262	2.050	1.483	.993	.026
.100	.006	.126	1.212	2.100	1.532	.995	.022
.150	.014	.186	1.162	2.150	1.582	.996	.018
.200	.025	.242	1.112	2.200	1.632	.996	.015
.250	.038	.297	1.062	2.250	1.682	.997	.013
.300	.055	.349	1.013	2.300	1.732	.998	.010
.350	.073	.398	.963	2.350	1.782	.998	.008
.400	.094	.445	.915	2.400	1.831	.998	.007
.450	.118	.489	.866	2.450	1.881	.999	.006
.500	.143	.532	.818	2.500	1.931	.999	.005
.550	.171	.571	.771	2.550	1.981	.999	.004
.600	.200	.609	.725	2.600	2.031	.999	.003
.650	.232	.644	.679	2.650	2.081	1.000	.002
.700	.265	.677	.635	2.700	2.131	1.000	.002
.750	.299	.707	.591	2.750	2.181	1.000	.001
.800	.335	.736	.549	2.800	2.231	1.000	.001
.850	.373	.762	.509	2.850	2.281	1.000	.001
.900	.412	.787	.469	2.900	2.331	1.000	.001
.950	.451	.809	.432	2.950	2.381	1.000	.001
1.000	.492	.830	.396	3.000	2.431	1.000	.000
1.050	.534	.849	.362	3.050	2.481	1.000	.000
1.100	.577	.866	.329	3.100	2.531	1.000	.000
1.150	.621	.882	.299	3.150	2.581	1.000	.000
1.200	.665	.896	.270	3.200	2.631	1.000	.000
1.250	.711	.909	.243	3.250	2.681	1.000	.000
1.300	.756	.920	.218	3.300	2.731	1.000	.000
1.350	.803	.931	.195	3.350	2.781	1.000	.000
1.400	.849	.940	.173	3.400	2.831	1.000	.000
1.450	.897	.948	.154	3.450	2.881	1.000	.000
1.500	.944	.955	.136	3.500	2.931	1.000	.000
1.550	.992	.962	.119	3.550	2.981	1.000	.000
1.600	1.040	.967	.104	3.600	3.031	1.000	.000
1.650	1.089	.972	.091	3.650	3.081	1.000	.000
1.700	1.137	.976	.079	3.700	3.131	1.000	.000
1.750	1.186	.980	.068	3.750	3.181	1.000	.000
1.800	1.235	.983	.059	3.800	3.231	1.000	.000
1.850	1.285	.986	.050	3.850	3.281	1.000	.000
1.900	1.334	.988	.043	3.900	3.331	1.000	.000
1.950	1.383	.990	.037	3.950	3.381	1.000	.000
				4.000	3.431	1.000	.000

TABLE II. - Continued. NUMERICAL SOLUTION TO CASE II ($U = ax^n z^{m-1}$, $W = bx^{n-1}z^m$)

(3) $p = 1$ and $m + n = 3$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.771	2.000	1.558	0.999	0.007
.050	.002	.086	1.671	2.050	1.608	.999	.006
.100	.009	.167	1.572	2.100	1.658	.999	.005
.150	.019	.243	1.474	2.150	1.708	.999	.004
.200	.033	.315	1.377	2.200	1.758	.999	.003
.250	.050	.381	1.282	2.250	1.808	1.000	.002
.300	.071	.443	1.190	2.300	1.858	1.000	.002
.350	.094	.500	1.101	2.350	1.908	1.000	.001
.400	.121	.553	1.014	2.400	1.958	1.000	.001
.450	.150	.602	.931	2.450	2.008	1.000	.001
.500	.181	.646	.852	2.500	2.058	1.000	.001
.550	.214	.687	.776	2.550	2.108	1.000	.000
.600	.249	.724	.705	2.600	2.158	1.000	.000
.650	.286	.757	.637	2.650	2.208	1.000	.000
.700	.325	.788	.574	2.700	2.258	1.000	.000
.750	.365	.815	.515	2.750	2.308	1.000	.000
.800	.407	.839	.460	2.800	2.358	1.000	.000
.850	.449	.861	.409	2.850	2.408	1.000	.000
.900	.493	.880	.362	2.900	2.458	1.000	.000
.950	.537	.897	.319	2.950	2.508	1.000	.000
1.000	.582	.912	.280	3.000	2.558	1.000	.000
1.050	.628	.925	.245	3.050	2.608	1.000	.000
1.100	.675	.937	.213	3.100	2.658	1.000	.000
1.150	.722	.947	.184	3.150	2.708	1.000	.000
1.200	.769	.955	.159	3.200	2.758	1.000	.000
1.250	.817	.962	.136	3.250	2.808	1.000	.000
1.300	.866	.969	.116	3.300	2.858	1.000	.000
1.350	.914	.974	.099	3.350	2.908	1.000	.000
1.400	.963	.979	.083	3.400	2.958	1.000	.000
1.450	1.012	.982	.070	3.450	3.008	1.000	.000
1.500	1.061	.986	.059	3.500	3.058	1.000	.000
1.550	1.111	.988	.049	3.550	3.108	1.000	.000
1.600	1.160	.991	.040	3.600	3.158	1.000	.000
1.650	1.210	.992	.033	3.650	3.208	1.000	.000
1.700	1.259	.994	.027	3.700	3.258	1.000	.000
1.750	1.309	.995	.022	3.750	3.308	1.000	.000
1.800	1.359	.996	.018	3.800	3.358	1.000	.000
1.850	1.409	.997	.014	3.850	3.408	1.000	.000
1.900	1.459	.998	.012	3.900	3.458	1.000	.000
1.950	1.508	.998	.009	3.950	3.508	1.000	.000
				4.000	3.558	1.000	.000

(4) $p = 1$ and $m + n = 4$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	2.135	1.500	1.127	0.995	0.027
.050	.003	.103	1.985	1.550	1.177	.996	.022
.100	.010	.199	1.837	1.600	1.227	.997	.017
.150	.022	.287	1.692	1.650	1.276	.998	.013
.200	.039	.368	1.551	1.700	1.326	.998	.010
.250	.059	.442	1.415	1.750	1.376	.999	.008
.300	.083	.509	1.284	1.800	1.426	.999	.006
.350	.110	.570	1.161	1.850	1.476	.999	.005
.400	.140	.626	1.044	1.900	1.526	.999	.004
.450	.172	.675	.934	1.950	1.576	1.000	.003
.500	.207	.719	.832	2.000	1.626	1.000	.002
.550	.244	.758	.738	2.050	1.676	1.000	.002
.600	.283	.793	.651	2.100	1.726	1.000	.001
.650	.323	.824	.571	2.150	1.776	1.000	.001
.700	.365	.850	.499	2.200	1.826	1.000	.001
.750	.408	.874	.433	2.250	1.876	1.000	.000
.800	.453	.894	.375	2.300	1.926	1.000	.000
.850	.498	.911	.322	2.350	1.976	1.000	.000
.900	.544	.926	.275	2.400	2.026	1.000	.000
.950	.590	.939	.234	2.450	2.076	1.000	.000
1.000	.637	.950	.198	2.500	2.126	1.000	.000
1.050	.685	.959	.167	2.550	2.176	1.000	.000
1.100	.733	.966	.139	2.600	2.226	1.000	.000
1.150	.782	.973	.116	2.650	2.276	1.000	.000
1.200	.831	.978	.096	2.700	2.326	1.000	.000
1.250	.880	.982	.079	2.750	2.376	1.000	.000
1.300	.929	.986	.065	2.800	2.426	1.000	.000
1.350	.978	.989	.052	2.850	2.476	1.000	.000
1.400	1.028	.991	.042	2.900	2.526	1.000	.000
1.450	1.077	.993	.034	2.950	2.576	1.000	.000
				3.000	2.626	1.000	.000

TABLE II. - Continued. NUMERICAL SOLUTION TO CASE II ($U = ax^n z^{m-1}$, $W = bx^{n-1} z^m$)

(5) $p = 1$ and $m + n = 5$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	2.445	1.500	1.170	0.998	0.013
.050	.003	.117	2.246	1.550	1.220	.998	.010
.100	.012	.225	2.049	1.600	1.270	.999	.008
.150	.025	.322	1.858	1.650	1.320	.999	.006
.200	.044	.411	1.675	1.700	1.370	.999	.004
.250	.066	.490	1.501	1.750	1.420	1.000	.003
.300	.092	.561	1.337	1.800	1.470	1.000	.002
.350	.122	.624	1.184	1.850	1.520	1.000	.002
.400	.155	.679	1.042	1.900	1.570	1.000	.001
.450	.190	.728	.912	1.950	1.620	1.000	.001
.500	.227	.771	.793	2.000	1.670	1.000	.001
.550	.267	.808	.686	2.050	1.720	1.000	.000
.600	.308	.840	.590	2.100	1.770	1.000	.000
.650	.351	.867	.504	2.150	1.820	1.000	.000
.700	.395	.890	.428	2.200	1.870	1.000	.000
.750	.440	.910	.362	2.250	1.920	1.000	.000
.800	.486	.926	.304	2.300	1.970	1.000	.000
.850	.532	.940	.253	2.350	2.020	1.000	.000
.900	.580	.952	.210	2.400	2.070	1.000	.000
.950	.628	.961	.173	2.450	2.120	1.000	.000
1.000	.676	.969	.141	2.500	2.170	1.000	.000
1.050	.724	.976	.115	2.550	2.220	1.000	.000
1.100	.773	.981	.093	2.600	2.270	1.000	.000
1.150	.823	.985	.075	2.650	2.320	1.000	.000
1.200	.872	.988	.059	2.700	2.370	1.000	.000
1.250	.921	.991	.047	2.750	2.420	1.000	.000
1.300	.971	.993	.037	2.800	2.470	1.000	.000
1.350	1.021	.995	.029	2.850	2.520	1.000	.000
1.400	1.070	.996	.022	2.900	2.570	1.000	.000
1.450	1.120	.997	.017	2.950	2.620	1.000	.000
				3.000	2.670	1.000	.000

(6) $p = 1$ and $m + n = 6$

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	2.721	1.500	1.201	0.999	0.007
.050	.003	.130	2.471	1.550	1.251	.999	.005
.100	.013	.247	2.227	1.600	1.301	1.000	.003
.150	.028	.353	1.992	1.650	1.351	1.000	.002
.200	.048	.447	1.768	1.700	1.401	1.000	.002
.250	.072	.530	1.558	1.750	1.451	1.000	.001
.300	.101	.603	1.364	1.800	1.501	1.000	.001
.350	.132	.666	1.185	1.850	1.551	1.000	.001
.400	.167	.721	1.023	1.900	1.601	1.000	.000
.450	.204	.769	.877	1.950	1.651	1.000	.000
.500	.244	.809	.747	2.000	1.701	1.000	.000
.550	.285	.844	.631	2.050	1.751	1.000	.000
.600	.328	.873	.530	2.100	1.801	1.000	.000
.650	.372	.897	.442	2.150	1.851	1.000	.000
.700	.418	.917	.366	2.200	1.901	1.000	.000
.750	.464	.934	.301	2.250	1.951	1.000	.000
.800	.511	.948	.246	2.300	2.001	1.000	.000
.850	.559	.959	.200	2.350	2.051	1.000	.000
.900	.607	.968	.161	2.400	2.101	1.000	.000
.950	.656	.975	.128	2.450	2.151	1.000	.000
1.000	.704	.981	.102	2.500	2.201	1.000	.000
1.050	.754	.985	.080	2.550	2.251	1.000	.000
1.100	.803	.989	.063	2.600	2.301	1.000	.000
1.150	.852	.991	.049	2.650	2.351	1.000	.000
1.200	.902	.994	.037	2.700	2.401	1.000	.000
1.250	.952	.995	.029	2.750	2.451	1.000	.000
1.300	1.002	.996	.022	2.800	2.501	1.000	.000
1.350	1.051	.997	.016	2.850	2.551	1.000	.000
1.400	1.101	.998	.012	2.900	2.601	1.000	.000
1.450	1.151	.999	.009	2.950	2.651	1.000	.000
				3.000	2.701	1.000	.000

TABLE II. - Continued. NUMERICAL SOLUTION TO CASE II ($U = ax^n z^{m-1}$, $W = bx^{n-1}z^m$)

(7) p = 1 and m + n = 8

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	3.201	1.500	1.244	1.000	0.002
.050	.004	.151	2.853	1.550	1.294	1.000	.001
.100	.015	.285	2.515	1.600	1.344	1.000	.001
.150	.032	.403	2.193	1.650	1.394	1.000	.001
.200	.055	.505	1.894	1.700	1.444	1.000	.000
.250	.082	.593	1.621	1.750	1.494	1.000	.000
.300	.114	.668	1.374	1.800	1.544	1.000	.000
.350	.149	.731	1.154	1.850	1.594	1.000	.000
.400	.187	.784	.961	1.900	1.644	1.000	.000
.450	.227	.827	.794	1.950	1.694	1.000	.000
.500	.269	.863	.650	2.000	1.744	1.000	.000
.550	.313	.893	.527	2.050	1.794	1.000	.000
.600	.359	.916	.424	2.100	1.844	1.000	.000
.650	.405	.935	.338	2.150	1.894	1.000	.000
.700	.452	.950	.268	2.200	1.944	1.000	.000
.750	.500	.962	.210	2.250	1.994	1.000	.000
.800	.548	.972	.163	2.300	2.044	1.000	.000
.850	.597	.979	.125	2.350	2.094	1.000	.000
.900	.646	.984	.096	2.400	2.144	1.000	.000
.950	.696	.988	.072	2.450	2.194	1.000	.000
1.000	.745	.992	.054	2.500	2.244	1.000	.000
1.050	.795	.994	.040	2.550	2.294	1.000	.000
1.100	.844	.996	.029	2.600	2.344	1.000	.000
1.150	.894	.997	.021	2.650	2.394	1.000	.000
1.200	.944	.998	.015	2.700	2.444	1.000	.000
1.250	.994	.999	.011	2.750	2.494	1.000	.000
1.300	1.044	.999	.008	2.800	2.544	1.000	.000
1.350	1.094	.999	.005	2.850	2.594	1.000	.000
1.400	1.144	1.000	.004	2.900	2.644	1.000	.000
1.450	1.194	1.000	.003	2.950	2.694	1.000	.000
				3.000	2.744	1.000	.000

(8) p = 1 and m + n = 10

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	3.618	1.500	1.272	1.000	0.000
.050	.004	.170	3.171	1.550	1.322	1.000	.000
.100	.017	.317	2.741	1.600	1.372	1.000	.000
.150	.036	.444	2.338	1.650	1.422	1.000	.000
.200	.061	.552	1.970	1.700	1.472	1.000	.000
.250	.091	.642	1.641	1.750	1.522	1.000	.000
.300	.125	.717	1.352	1.800	1.572	1.000	.000
.350	.162	.778	1.101	1.850	1.622	1.000	.000
.400	.202	.827	.888	1.900	1.672	1.000	.000
.450	.245	.867	.709	1.950	1.722	1.000	.000
.500	.289	.899	.560	2.000	1.772	1.000	.000
.550	.334	.923	.437	2.050	1.822	1.000	.000
.600	.381	.943	.338	2.100	1.872	1.000	.000
.650	.429	.958	.259	2.150	1.922	1.000	.000
.700	.477	.969	.196	2.200	1.972	1.000	.000
.750	.525	.977	.147	2.250	2.022	1.000	.000
.800	.574	.984	.109	2.300	2.072	1.000	.000
.850	.624	.988	.080	2.350	2.122	1.000	.000
.900	.673	.992	.058	2.400	2.172	1.000	.000
.950	.723	.994	.041	2.450	2.222	1.000	.000
1.000	.773	.996	.029	2.500	2.272	1.000	.000
1.050	.823	.997	.021	2.550	2.322	1.000	.000
1.100	.872	.998	.014	2.600	2.372	1.000	.000
1.150	.922	.999	.010	2.650	2.422	1.000	.000
1.200	.972	.999	.007	2.700	2.472	1.000	.000
1.250	1.022	.999	.004	2.750	2.522	1.000	.000
1.300	1.072	1.000	.003	2.800	2.572	1.000	.000
1.350	1.122	1.000	.002	2.850	2.622	1.000	.000
1.400	1.172	1.000	.001	2.900	2.672	1.000	.000
1.450	1.222	1.000	.001	2.950	2.722	1.000	.000
				3.000	2.772	1.000	.000

TABLE II. - Continued. NUMERICAL SOLUTION TO CASE II ($U = ax^n z^{m-1}$, $W = bx^{n-1}z^m$)

(9) $p = 2$, $n = 0$, and $m = 1$

(a) Tabulation of $F(\eta)$ and derivatives

η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$	η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$
0.000	0.000	0.000	0.815	2.000	1.294	0.987	0.053
.050	.001	.041	.815	2.050	1.343	.989	.044
.100	.004	.082	.815	2.100	1.393	.991	.037
.150	.009	.122	.814	2.150	1.442	.993	.030
.200	.016	.163	.812	2.200	1.492	.994	.025
.250	.025	.203	.809	2.250	1.542	.996	.020
.300	.037	.244	.805	2.300	1.592	.997	.017
.350	.050	.284	.799	2.350	1.641	.997	.013
.400	.065	.324	.791	2.400	1.691	.998	.011
.450	.082	.363	.781	2.450	1.741	.998	.008
.500	.101	.402	.770	2.500	1.791	.999	.007
.550	.122	.440	.756	2.550	1.841	.999	.005
.600	.145	.477	.739	2.600	1.891	.999	.004
.650	.170	.514	.721	2.650	1.941	.999	.003
.700	.197	.549	.700	2.700	1.991	1.000	.002
.750	.225	.584	.677	2.750	2.041	1.000	.002
.800	.255	.617	.652	2.800	2.091	1.000	.001
.850	.287	.649	.625	2.850	2.141	1.000	.001
.900	.320	.679	.597	2.900	2.191	1.000	.001
.950	.355	.709	.567	2.950	2.241	1.000	.001
1.000	.391	.736	.536	3.000	2.291	1.000	.000
1.050	.428	.762	.504	3.050	2.341	1.000	.000
1.100	.467	.786	.471	3.100	2.391	1.000	.000
1.150	.507	.809	.438	3.150	2.441	1.000	.000
1.200	.548	.830	.406	3.200	2.491	1.000	.000
1.250	.590	.850	.373	3.250	2.541	1.000	.000
1.300	.633	.868	.342	3.300	2.591	1.000	.000
1.350	.677	.884	.311	3.350	2.641	1.000	.000
1.400	.721	.899	.281	3.400	2.691	1.000	.000
1.450	.766	.912	.253	3.450	2.741	1.000	.000
1.500	.812	.924	.226	3.500	2.791	1.000	.000
1.550	.859	.935	.201	3.550	2.841	1.000	.000
1.600	.906	.944	.178	3.600	2.891	1.000	.000
1.650	.953	.953	.156	3.650	2.941	1.000	.000
1.700	1.001	.960	.136	3.700	2.991	1.000	.000
1.750	1.049	.966	.118	3.750	3.041	1.000	.000
1.800	1.098	.972	.102	3.800	3.091	1.000	.000
1.850	1.146	.977	.087	3.850	3.141	1.000	.000
1.900	1.195	.981	.075	3.900	3.191	1.000	.000
1.950	1.244	.984	.063	3.950	3.241	1.000	.000
				4.000	3.291	1.000	.000

(b) Tabulation of $G(\eta)$ and derivatives

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.306	2.000	1.434	0.994	0.027
.050	.002	.064	1.256	2.050	1.484	.995	.023
.100	.006	.126	1.206	2.100	1.534	.996	.019
.150	.014	.185	1.157	2.150	1.584	.997	.015
.200	.025	.241	1.107	2.200	1.634	.997	.012
.250	.038	.295	1.058	2.250	1.683	.998	.010
.300	.054	.347	1.009	2.300	1.733	.998	.008
.350	.073	.396	.961	2.350	1.783	.999	.006
.400	.094	.443	.913	2.400	1.833	.999	.005
.450	.117	.488	.866	2.450	1.883	.999	.004
.500	.143	.530	.819	2.500	1.933	.999	.003
.550	.170	.570	.773	2.550	1.983	1.000	.002
.600	.200	.607	.728	2.600	2.033	1.000	.002
.650	.231	.642	.683	2.650	2.083	1.000	.001
.700	.264	.675	.640	2.700	2.133	1.000	.001
.750	.298	.706	.598	2.750	2.183	1.000	.001
.800	.334	.735	.556	2.800	2.233	1.000	.001
.850	.372	.762	.516	2.850	2.283	1.000	.000
.900	.410	.787	.477	2.900	2.333	1.000	.000
.950	.450	.810	.440	2.950	2.383	1.000	.000
1.000	.491	.831	.404	3.000	2.433	1.000	.000
1.050	.533	.850	.369	3.050	2.483	1.000	.000
1.100	.576	.868	.336	3.100	2.533	1.000	.000
1.150	.620	.884	.305	3.150	2.583	1.000	.000
1.200	.665	.898	.275	3.200	2.633	1.000	.000
1.250	.710	.911	.247	3.250	2.683	1.000	.000
1.300	.756	.923	.221	3.300	2.733	1.000	.000
1.350	.802	.933	.197	3.350	2.783	1.000	.000
1.400	.849	.943	.175	3.400	2.833	1.000	.000
1.450	.897	.951	.154	3.450	2.883	1.000	.000
1.500	.944	.958	.135	3.500	2.933	1.000	.000
1.550	.992	.965	.118	3.550	2.983	1.000	.000
1.600	1.041	.970	.103	3.600	3.033	1.000	.000
1.650	1.089	.975	.089	3.650	3.083	1.000	.000
1.700	1.138	.979	.076	3.700	3.133	1.000	.000
1.750	1.187	.982	.065	3.750	3.183	1.000	.000
1.800	1.236	.986	.055	3.800	3.233	1.000	.000
1.850	1.286	.988	.047	3.850	3.283	1.000	.000
1.900	1.335	.990	.039	3.900	3.333	1.000	.000
1.950	1.385	.992	.033	3.950	3.383	1.000	.000
				4.000	3.433	1.000	.000

TABLE II. - Continued. NUMERICAL SOLUTION TO CASE II ($U = ax^n z^{m-1}$, $W = bx^{n-1} z^m$)

(10) $p = 2$, $n = 0$, and $m = 3$

(a) Tabulation of $F(\eta)$ and derivatives

η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$	η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$
0.000	0.000	0.000	2.473	1.500	1.179	0.999	0.009
.050	.003	.119	2.273	1.550	1.229	.999	.006
.100	.012	.227	2.077	1.600	1.279	.999	.004
.150	.026	.326	1.885	1.650	1.329	1.000	.003
.200	.044	.416	1.700	1.700	1.379	1.000	.002
.250	.067	.497	1.524	1.750	1.429	1.000	.002
.300	.094	.569	1.357	1.800	1.479	1.000	.001
.350	.124	.632	1.200	1.850	1.529	1.000	.001
.400	.157	.689	1.055	1.900	1.579	1.000	.000
.450	.193	.738	.921	1.950	1.629	1.000	.000
.500	.231	.781	.799	2.000	1.679	1.000	.000
.550	.271	.818	.688	2.050	1.729	1.000	.000
.600	.312	.850	.588	2.100	1.779	1.000	.000
.650	.355	.877	.499	2.150	1.829	1.000	.000
.700	.400	.900	.420	2.200	1.879	1.000	.000
.750	.445	.919	.351	2.250	1.929	1.000	.000
.800	.492	.935	.291	2.300	1.979	1.000	.000
.850	.539	.949	.239	2.350	2.029	1.000	.000
.900	.587	.959	.195	2.400	2.079	1.000	.000
.950	.635	.968	.158	2.450	2.129	1.000	.000
1.000	.683	.975	.127	2.500	2.179	1.000	.000
1.050	.732	.981	.101	2.550	2.229	1.000	.000
1.100	.781	.985	.080	2.600	2.279	1.000	.000
1.150	.831	.989	.062	2.650	2.329	1.000	.000
1.200	.880	.992	.048	2.700	2.379	1.000	.000
1.250	.930	.994	.037	2.750	2.429	1.000	.000
1.300	.980	.995	.028	2.800	2.479	1.000	.000
1.350	1.029	.997	.021	2.850	2.529	1.000	.000
1.400	1.079	.998	.016	2.900	2.579	1.000	.000
1.450	1.129	.998	.012	2.950	2.629	1.000	.000
				3.000	2.679	1.000	.000

(b) Tabulation of $G(\eta)$ and derivatives

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	2.732	1.500	1.204	0.999	0.005
.050	.003	.130	2.483	1.550	1.254	.999	.004
.100	.013	.248	2.238	1.600	1.304	1.000	.003
.150	.028	.354	2.002	1.650	1.354	1.000	.002
.200	.048	.449	1.778	1.700	1.404	1.000	.001
.250	.073	.532	1.567	1.750	1.454	1.000	.001
.300	.101	.606	1.371	1.800	1.504	1.000	.001
.350	.133	.670	1.191	1.850	1.554	1.000	.000
.400	.168	.725	1.027	1.900	1.604	1.000	.000
.450	.205	.773	.879	1.950	1.654	1.000	.000
.500	.245	.813	.747	2.000	1.704	1.000	.000
.550	.287	.848	.631	2.050	1.754	1.000	.000
.600	.330	.877	.528	2.100	1.804	1.000	.000
.650	.374	.901	.439	2.150	1.854	1.000	.000
.700	.420	.921	.362	2.200	1.904	1.000	.000
.750	.466	.937	.296	2.250	1.954	1.000	.000
.800	.513	.951	.241	2.300	2.004	1.000	.000
.850	.561	.961	.194	2.350	2.054	1.000	.000
.900	.610	.970	.155	2.400	2.104	1.000	.000
.950	.658	.977	.123	2.450	2.154	1.000	.000
1.000	.707	.982	.096	2.500	2.204	1.000	.000
1.050	.756	.987	.075	2.550	2.254	1.000	.000
1.100	.806	.990	.058	2.600	2.304	1.000	.000
1.150	.855	.993	.044	2.650	2.354	1.000	.000
1.200	.905	.995	.034	2.700	2.404	1.000	.000
1.250	.955	.996	.025	2.750	2.454	1.000	.000
1.300	1.005	.997	.019	2.800	2.504	1.000	.000
1.350	1.055	.998	.014	2.850	2.554	1.000	.000
1.400	1.105	.999	.010	2.900	2.604	1.000	.000
1.450	1.154	.999	.007	2.950	2.654	1.000	.000
				3.000	2.704	1.000	.000

TABLE II. - Continued. NUMERICAL SOLUTION TO CASE II ($U = ax^n z^{m-1}$, $W = bx^{n-1} z^m$)

(11) $p = 2$, $n = 0$, and $m = 5$

(a) Tabulation of $F(\eta)$ and derivatives

η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$	η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$
0.000	0.000	0.000	3.431	1.000	0.763	0.995	0.035
.025	.001	.083	3.231	1.025	.788	.996	.030
.050	.004	.162	3.033	1.050	.813	.997	.025
.075	.009	.235	2.838	1.075	.837	.997	.021
.100	.016	.304	2.648	1.100	.862	.998	.017
.125	.024	.367	2.463	1.125	.887	.998	.014
.150	.034	.427	2.285	1.150	.912	.999	.012
.175	.046	.482	2.113	1.175	.937	.999	.010
.200	.058	.532	1.949	1.200	.962	.999	.008
.225	.072	.579	1.792	1.225	.987	.999	.007
.250	.087	.622	1.644	1.250	1.012	.999	.005
.275	.103	.661	1.504	1.275	1.037	1.000	.004
.300	.120	.697	1.373	1.300	1.062	1.000	.004
.325	.138	.730	1.249	1.325	1.087	1.000	.003
.350	.157	.760	1.134	1.350	1.112	1.000	.002
.375	.176	.787	1.027	1.375	1.137	1.000	.002
.400	.196	.811	.927	1.400	1.162	1.000	.001
.425	.217	.833	.835	1.425	1.187	1.000	.001
.450	.238	.853	.750	1.450	1.212	1.000	.001
.475	.259	.871	.672	1.475	1.237	1.000	.001
.500	.281	.887	.600	1.500	1.262	1.000	.001
.525	.304	.901	.535	1.525	1.287	1.000	.000
.550	.326	.914	.476	1.550	1.312	1.000	.000
.575	.349	.925	.422	1.575	1.337	1.000	.000
.600	.372	.935	.373	1.600	1.362	1.000	.000
.625	.396	.944	.329	1.625	1.387	1.000	.000
.650	.420	.951	.289	1.650	1.412	1.000	.000
.675	.443	.958	.253	1.675	1.437	1.000	.000
.700	.468	.964	.221	1.700	1.462	1.000	.000
.725	.492	.969	.193	1.725	1.487	1.000	.000
.750	.516	.974	.168	1.750	1.512	1.000	.000
.775	.540	.978	.145	1.775	1.537	1.000	.000
.800	.565	.981	.126	1.800	1.562	1.000	.000
.825	.589	.984	.108	1.825	1.587	1.000	.000
.850	.614	.986	.093	1.850	1.612	1.000	.000
.875	.639	.988	.080	1.875	1.637	1.000	.000
.900	.663	.990	.068	1.900	1.662	1.000	.000
.925	.688	.992	.058	1.925	1.687	1.000	.000
.950	.713	.993	.049	1.950	1.712	1.000	.000
.975	.738	.994	.042	1.975	1.737	1.000	.000
				2.000	1.762	1.000	.000

(b) Tabulation of $G(\eta)$ and derivatives

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	3.629	1.000	0.774	0.997	0.027
.025	.001	.088	3.404	1.025	.799	.997	.022
.050	.004	.170	3.182	1.050	.824	.998	.019
.075	.010	.247	2.963	1.075	.849	.998	.015
.100	.017	.318	2.751	1.100	.874	.998	.013
.125	.025	.385	2.545	1.125	.899	.999	.010
.150	.036	.446	2.347	1.150	.924	.999	.009
.175	.048	.502	2.158	1.175	.949	.999	.007
.200	.061	.554	1.978	1.200	.974	.999	.006
.225	.075	.601	1.807	1.225	.999	.999	.005
.250	.091	.644	1.647	1.250	1.024	1.000	.004
.275	.108	.683	1.496	1.275	1.049	1.000	.003
.300	.125	.719	1.355	1.300	1.074	1.000	.002
.325	.143	.751	1.225	1.325	1.099	1.000	.002
.350	.163	.780	1.103	1.350	1.124	1.000	.002
.375	.182	.806	.991	1.375	1.149	1.000	.001
.400	.203	.830	.888	1.400	1.174	1.000	.001
.425	.224	.851	.793	1.425	1.199	1.000	.001
.450	.245	.870	.707	1.450	1.224	1.000	.001
.475	.267	.886	.628	1.475	1.249	1.000	.000
.500	.290	.901	.556	1.500	1.274	1.000	.000
.525	.312	.914	.492	1.525	1.299	1.000	.000
.550	.335	.926	.433	1.550	1.324	1.000	.000
.575	.359	.936	.381	1.575	1.349	1.000	.000
.600	.382	.945	.334	1.600	1.374	1.000	.000
.625	.406	.953	.291	1.625	1.399	1.000	.000
.650	.430	.959	.254	1.650	1.424	1.000	.000
.675	.454	.965	.221	1.675	1.449	1.000	.000
.700	.478	.971	.191	1.700	1.474	1.000	.000
.725	.502	.975	.165	1.725	1.499	1.000	.000
.750	.527	.979	.142	1.750	1.524	1.000	.000
.775	.551	.982	.122	1.775	1.549	1.000	.000
.800	.576	.985	.104	1.800	1.574	1.000	.000
.825	.601	.987	.089	1.825	1.599	1.000	.000
.850	.625	.989	.076	1.850	1.624	1.000	.000
.875	.650	.991	.064	1.875	1.649	1.000	.000
.900	.675	.993	.054	1.900	1.674	1.000	.000
.925	.700	.994	.046	1.925	1.699	1.000	.000
.950	.725	.995	.039	1.950	1.724	1.000	.000
.975	.749	.996	.032	1.975	1.749	1.000	.000
				2.000	1.774	1.000	.000

TABLE II. - Continued. NUMERICAL SOLUTION TO CASE II ($U = ax^n z^{m-1}$, $W = bx^{n-1}z^m$)

(12) $p = 2$, $n = 1$, and $m = 1$

(a) Tabulation of $F(\eta)$ and derivatives

η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$	η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$
0.000	0.000	0.000	1.412	2.000	1.497	0.998	0.010
.050	.002	.069	1.361	2.050	1.547	.999	.007
.100	.007	.136	1.311	2.100	1.597	.999	.006
.150	.015	.200	1.260	2.150	1.647	.999	.004
.200	.027	.262	1.208	2.200	1.697	.999	.003
.250	.041	.321	1.156	2.250	1.747	1.000	.003
.300	.059	.378	1.102	2.300	1.797	1.000	.002
.350	.079	.431	1.048	2.350	1.847	1.000	.001
.400	.102	.482	.992	2.400	1.897	1.000	.001
.450	.127	.531	.937	2.450	1.947	1.000	.001
.500	.155	.576	.880	2.500	1.997	1.000	.001
.550	.185	.619	.824	2.550	2.047	1.000	.000
.600	.217	.658	.768	2.600	2.097	1.000	.000
.650	.251	.695	.712	2.650	2.147	1.000	.000
.700	.286	.730	.657	2.700	2.197	1.000	.000
.750	.324	.761	.603	2.750	2.247	1.000	.000
.800	.362	.790	.551	2.800	2.297	1.000	.000
.850	.403	.816	.500	2.850	2.347	1.000	.000
.900	.444	.840	.452	2.900	2.397	1.000	.000
.950	.487	.862	.406	2.950	2.447	1.000	.000
1.000	.530	.881	.362	3.000	2.497	1.000	.000
1.050	.575	.898	.322	3.050	2.547	1.000	.000
1.100	.620	.913	.284	3.100	2.597	1.000	.000
1.150	.666	.926	.249	3.150	2.647	1.000	.000
1.200	.713	.938	.217	3.200	2.697	1.000	.000
1.250	.760	.948	.187	3.250	2.747	1.000	.000
1.300	.807	.957	.161	3.300	2.797	1.000	.000
1.350	.855	.964	.138	3.350	2.847	1.000	.000
1.400	.904	.970	.117	3.400	2.897	1.000	.000
1.450	.952	.976	.099	3.450	2.947	1.000	.000
1.500	1.001	.980	.083	3.500	2.997	1.000	.000
1.550	1.050	.984	.069	3.550	3.047	1.000	.000
1.600	1.100	.987	.057	3.600	3.097	1.000	.000
1.650	1.149	.990	.047	3.650	3.147	1.000	.000
1.700	1.199	.992	.038	3.700	3.197	1.000	.000
1.750	1.248	.994	.031	3.750	3.247	1.000	.000
1.800	1.298	.995	.025	3.800	3.297	1.000	.000
1.850	1.348	.996	.020	3.850	3.347	1.000	.000
1.900	1.398	.997	.016	3.900	3.397	1.000	.000
1.950	1.448	.998	.012	3.950	3.447	1.000	.000
				4.000	3.497	1.000	.000

(b) Tabulation of $G(\eta)$ and derivatives

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.792	2.000	1.570	0.999	0.005
.050	.002	.087	1.692	2.050	1.620	.999	.004
.100	.009	.169	1.592	2.100	1.670	1.000	.003
.150	.019	.246	1.494	2.150	1.719	1.000	.002
.200	.033	.319	1.397	2.200	1.769	1.000	.002
.250	.051	.386	1.301	2.250	1.819	1.000	.001
.300	.072	.449	1.208	2.300	1.869	1.000	.001
.350	.096	.507	1.117	2.350	1.919	1.000	.001
.400	.122	.560	1.029	2.400	1.969	1.000	.000
.450	.152	.610	.944	2.450	2.019	1.000	.000
.500	.183	.655	.863	2.500	2.069	1.000	.000
.550	.217	.696	.785	2.550	2.119	1.000	.000
.600	.253	.734	.711	2.600	2.169	1.000	.000
.650	.290	.767	.641	2.650	2.219	1.000	.000
.700	.329	.798	.576	2.700	2.269	1.000	.000
.750	.370	.825	.514	2.750	2.319	1.000	.000
.800	.412	.849	.457	2.800	2.369	1.000	.000
.850	.455	.871	.404	2.850	2.419	1.000	.000
.900	.499	.890	.356	2.900	2.469	1.000	.000
.950	.544	.906	.311	2.950	2.519	1.000	.000
1.000	.590	.921	.271	3.000	2.569	1.000	.000
1.050	.636	.934	.235	3.050	2.619	1.000	.000
1.100	.683	.945	.202	3.100	2.669	1.000	.000
1.150	.730	.954	.173	3.150	2.719	1.000	.000
1.200	.778	.962	.147	3.200	2.769	1.000	.000
1.250	.827	.969	.124	3.250	2.819	1.000	.000
1.300	.875	.974	.105	3.300	2.869	1.000	.000
1.350	.924	.979	.087	3.350	2.919	1.000	.000
1.400	.973	.983	.073	3.400	2.969	1.000	.000
1.450	1.022	.986	.060	3.450	3.019	1.000	.000
1.500	1.072	.989	.049	3.500	3.069	1.000	.000
1.550	1.121	.991	.040	3.550	3.119	1.000	.000
1.600	1.171	.993	.033	3.600	3.169	1.000	.000
1.650	1.220	.995	.026	3.650	3.219	1.000	.000
1.700	1.270	.996	.021	3.700	3.269	1.000	.000
1.750	1.320	.997	.017	3.750	3.319	1.000	.000
1.800	1.370	.998	.013	3.800	3.369	1.000	.000
1.850	1.420	.998	.010	3.850	3.419	1.000	.000
1.900	1.470	.999	.008	3.900	3.469	1.000	.000
1.950	1.520	.999	.006	3.950	3.519	1.000	.000
				4.000	3.569	1.000	.000

TABLE II. - Continued. NUMERICAL SOLUTION TO CASE II ($U = ax^n z^{m-1}$, $W = bx^{n-1}z^m$)

(13) $p = 2$, $n = 1$, and $m = 3$

(a) Tabulation of $F(\eta)$ and derivatives

η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$	η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$
0.000	0.000	0.000	2.747	1.500	1.208	0.999	0.004
.050	.003	.131	2.497	1.550	1.258	1.000	.003
.100	.013	.250	2.253	1.600	1.308	1.000	.002
.150	.028	.356	2.016	1.650	1.358	1.000	.001
.200	.048	.452	1.791	1.700	1.408	1.000	.001
.250	.073	.536	1.578	1.750	1.458	1.000	.001
.300	.102	.610	1.380	1.800	1.508	1.000	.000
.350	.134	.674	1.198	1.850	1.558	1.000	.000
.400	.169	.730	1.032	1.900	1.608	1.000	.000
.450	.207	.778	.882	1.950	1.658	1.000	.000
.500	.247	.818	.748	2.000	1.708	1.000	.000
.550	.288	.853	.629	2.050	1.758	1.000	.000
.600	.332	.881	.525	2.100	1.808	1.000	.000
.650	.377	.905	.434	2.150	1.858	1.000	.000
.700	.422	.925	.356	2.200	1.908	1.000	.000
.750	.469	.941	.289	2.250	1.958	1.000	.000
.800	.516	.954	.233	2.300	2.008	1.000	.000
.850	.564	.965	.186	2.350	2.058	1.000	.000
.900	.613	.973	.147	2.400	2.108	1.000	.000
.950	.662	.979	.116	2.450	2.158	1.000	.000
1.000	.711	.984	.090	2.500	2.208	1.000	.000
1.050	.760	.988	.069	2.550	2.258	1.000	.000
1.100	.809	.991	.053	2.600	2.308	1.000	.000
1.150	.859	.994	.040	2.650	2.358	1.000	.000
1.200	.909	.995	.030	2.700	2.408	1.000	.000
1.250	.959	.997	.022	2.750	2.458	1.000	.000
1.300	1.009	.998	.016	2.800	2.508	1.000	.000
1.350	1.058	.998	.012	2.850	2.558	1.000	.000
1.400	1.108	.999	.008	2.900	2.608	1.000	.000
1.450	1.158	.999	.006	2.950	2.658	1.000	.000
				3.000	2.708	1.000	.000

(b) Tabulation of $G(\eta)$ and derivatives

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	2.985	1.500	1.228	1.000	0.003
.050	.004	.142	2.686	1.550	1.278	1.000	.002
.100	.014	.269	2.394	1.600	1.328	1.000	.001
.150	.030	.381	2.115	1.650	1.378	1.000	.001
.200	.052	.480	1.851	1.700	1.428	1.000	.001
.250	.078	.567	1.607	1.750	1.478	1.000	.000
.300	.108	.641	1.382	1.800	1.528	1.000	.000
.350	.142	.705	1.180	1.850	1.578	1.000	.000
.400	.179	.760	.998	1.900	1.628	1.000	.000
.450	.218	.806	.837	1.950	1.678	1.000	.000
.500	.259	.844	.697	2.000	1.728	1.000	.000
.550	.302	.876	.575	2.050	1.778	1.000	.000
.600	.347	.902	.470	2.100	1.828	1.000	.000
.650	.392	.923	.381	2.150	1.878	1.000	.000
.700	.439	.940	.307	2.200	1.928	1.000	.000
.750	.486	.954	.244	2.250	1.978	1.000	.000
.800	.534	.965	.193	2.300	2.028	1.000	.000
.850	.583	.973	.151	2.350	2.078	1.000	.000
.900	.631	.980	.117	2.400	2.128	1.000	.000
.950	.681	.985	.090	2.450	2.178	1.000	.000
1.000	.730	.989	.068	2.500	2.228	1.000	.000
1.050	.779	.992	.051	2.550	2.278	1.000	.000
1.100	.829	.994	.038	2.600	2.328	1.000	.000
1.150	.879	.996	.028	2.650	2.378	1.000	.000
1.200	.929	.997	.021	2.700	2.428	1.000	.000
1.250	.979	.998	.015	2.750	2.478	1.000	.000
1.300	1.028	.999	.011	2.800	2.528	1.000	.000
1.350	1.078	.999	.008	2.850	2.578	1.000	.000
1.400	1.128	.999	.005	2.900	2.628	1.000	.000
1.450	1.178	1.000	.004	2.950	2.678	1.000	.000
				3.000	2.728	1.000	.000

TABLE II. - Continued. NUMERICAL SOLUTION TO CASE II ($U = ax^n z^{m-1}$, $W = bx^{n-1}z^m$)

(14) $p = 2$, $n = 1$, and $m = 5$

(a) Tabulation of $F(\eta)$ and derivatives

η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$	η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$
0.000	0.000	0.000	3.633	1.000	0.775	0.997	0.026
.025	.001	.088	3.409	1.025	.800	.997	.021
.050	.004	.170	3.186	1.050	.825	.998	.018
.075	.010	.247	2.968	1.075	.850	.998	.014
.100	.017	.319	2.755	1.100	.875	.999	.012
.125	.025	.385	2.549	1.125	.900	.999	.010
.150	.036	.446	2.351	1.150	.925	.999	.008
.175	.048	.503	2.162	1.175	.950	.999	.006
.200	.061	.555	1.981	1.200	.975	.999	.005
.225	.075	.602	1.811	1.225	1.000	1.000	.004
.250	.091	.645	1.650	1.250	1.025	1.000	.003
.275	.108	.685	1.499	1.275	1.050	1.000	.003
.300	.125	.720	1.358	1.300	1.075	1.000	.002
.325	.144	.752	1.226	1.325	1.100	1.000	.002
.350	.163	.782	1.105	1.350	1.125	1.000	.001
.375	.183	.808	.992	1.375	1.150	1.000	.001
.400	.203	.831	.888	1.400	1.175	1.000	.001
.425	.224	.852	.793	1.425	1.200	1.000	.001
.450	.246	.871	.706	1.450	1.225	1.000	.001
.475	.268	.888	.627	1.475	1.250	1.000	.000
.500	.290	.902	.555	1.500	1.275	1.000	.000
.525	.313	.916	.490	1.525	1.300	1.000	.000
.550	.336	.927	.432	1.550	1.325	1.000	.000
.575	.359	.937	.379	1.575	1.350	1.000	.000
.600	.383	.946	.331	1.600	1.375	1.000	.000
.625	.407	.954	.289	1.625	1.400	1.000	.000
.650	.430	.960	.251	1.650	1.425	1.000	.000
.675	.455	.966	.218	1.675	1.450	1.000	.000
.700	.479	.971	.189	1.700	1.475	1.000	.000
.725	.503	.976	.163	1.725	1.500	1.000	.000
.750	.528	.980	.140	1.750	1.525	1.000	.000
.775	.552	.983	.120	1.775	1.550	1.000	.000
.800	.577	.986	.102	1.800	1.575	1.000	.000
.825	.601	.988	.087	1.825	1.600	1.000	.000
.850	.626	.990	.074	1.850	1.625	1.000	.000
.875	.651	.992	.062	1.875	1.650	1.000	.000
.900	.676	.993	.053	1.900	1.675	1.000	.000
.925	.701	.994	.044	1.925	1.700	1.000	.000
.950	.725	.995	.037	1.950	1.725	1.000	.000
.975	.750	.996	.031	1.975	1.750	1.000	.000
				2.000	1.775	1.000	.000

(b) Tabulation of $G(\eta)$ and derivatives

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	3.822	1.000	0.785	0.998	0.020
.025	.001	.092	3.572	1.025	.810	.998	.016
.050	.005	.179	3.325	1.050	.835	.998	.013
.075	.010	.259	3.083	1.075	.860	.999	.011
.100	.017	.333	2.849	1.100	.885	.999	.009
.125	.027	.401	2.622	1.125	.910	.999	.007
.150	.037	.464	2.405	1.150	.935	.999	.006
.175	.050	.522	2.199	1.175	.960	1.000	.005
.200	.064	.574	2.003	1.200	.985	1.000	.004
.225	.078	.622	1.819	1.225	1.010	1.000	.003
.250	.095	.665	1.647	1.250	1.035	1.000	.002
.275	.112	.704	1.486	1.275	1.060	1.000	.002
.300	.130	.740	1.337	1.300	1.085	1.000	.001
.325	.149	.771	1.199	1.325	1.110	1.000	.001
.350	.168	.800	1.072	1.350	1.135	1.000	.001
.375	.189	.825	.956	1.375	1.160	1.000	.001
.400	.209	.847	.849	1.400	1.185	1.000	.001
.425	.231	.867	.753	1.425	1.210	1.000	.000
.450	.253	.885	.665	1.450	1.235	1.000	.000
.475	.275	.901	.586	1.475	1.260	1.000	.000
.500	.298	.914	.514	1.500	1.285	1.000	.000
.525	.321	.927	.450	1.525	1.310	1.000	.000
.550	.344	.937	.393	1.550	1.335	1.000	.000
.575	.368	.946	.342	1.575	1.360	1.000	.000
.600	.391	.954	.297	1.600	1.385	1.000	.000
.625	.415	.961	.256	1.625	1.410	1.000	.000
.650	.440	.967	.221	1.650	1.435	1.000	.000
.675	.464	.972	.190	1.675	1.460	1.000	.000
.700	.488	.977	.163	1.700	1.485	1.000	.000
.725	.513	.980	.139	1.725	1.510	1.000	.000
.750	.537	.984	.118	1.750	1.535	1.000	.000
.775	.562	.986	.100	1.775	1.560	1.000	.000
.800	.586	.989	.085	1.800	1.585	1.000	.000
.825	.611	.991	.072	1.825	1.610	1.000	.000
.850	.636	.992	.060	1.850	1.635	1.000	.000
.875	.661	.994	.050	1.875	1.660	1.000	.000
.900	.686	.995	.042	1.900	1.685	1.000	.000
.925	.711	.996	.035	1.925	1.710	1.000	.000
.950	.735	.996	.029	1.950	1.735	1.000	.000
.975	.760	.997	.024	1.975	1.760	1.000	.000
				2.000	1.785	1.000	.000

TABLE II. - Continued. NUMERICAL SOLUTION TO CASE II ($U = ax^n z^{m-1}$, $W = bx^{n-1}z^m$)

(15) $p = 2$, $n = 3$, and $m = 0$

(a) Tabulation of $F(\eta)$ and derivatives

η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$	η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$
0.000	0.000	0.000	1.439	1.500	1.013	0.983	0.079
.050	.002	.071	1.389	1.550	1.062	.987	.060
.100	.007	.139	1.339	1.600	1.112	.989	.049
.150	.016	.205	1.287	1.650	1.161	.992	.040
.200	.027	.268	1.234	1.700	1.211	.993	.032
.250	.042	.328	1.180	1.750	1.261	.995	.026
.300	.060	.386	1.125	1.800	1.310	.996	.021
.350	.081	.440	1.068	1.850	1.360	.997	.016
.400	.104	.492	1.010	1.900	1.410	.998	.013
.450	.130	.541	.951	1.950	1.460	.998	.010
.500	.158	.588	.892	2.000	1.510	.999	.008
.550	.189	.631	.832	2.050	1.560	.999	.006
.600	.221	.671	.772	2.100	1.610	.999	.005
.650	.256	.708	.713	2.150	1.660	.999	.003
.700	.292	.742	.655	2.200	1.710	1.000	.003
.750	.330	.773	.598	2.250	1.760	1.000	.002
.800	.369	.802	.543	2.300	1.810	1.000	.001
.850	.410	.828	.490	2.350	1.860	1.000	.001
.900	.452	.851	.440	2.400	1.910	1.000	.001
.950	.495	.872	.393	2.450	1.960	1.000	.001
1.000	.539	.890	.348	2.500	2.010	1.000	.000
1.050	.584	.907	.307	2.550	2.060	1.000	.000
1.100	.630	.921	.269	2.600	2.110	1.000	.000
1.150	.676	.934	.234	2.650	2.160	1.000	.000
1.200	.723	.944	.202	2.700	2.210	1.000	.000
1.250	.771	.954	.173	2.750	2.260	1.000	.000
1.300	.818	.962	.148	2.800	2.310	1.000	.000
1.350	.867	.969	.125	2.850	2.360	1.000	.000
1.400	.915	.974	.105	2.900	2.410	1.000	.000
1.450	.964	.979	.088	2.950	2.460	1.000	.000
				3.000	2.510	1.000	.000

(b) Tabulation of $G(\eta)$ and derivatives

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	1.818	1.500	1.082	0.991	0.041
.050	.002	.088	1.718	1.550	1.132	.993	.033
.100	.009	.172	1.618	1.600	1.182	.995	.026
.150	.019	.250	1.519	1.650	1.231	.996	.021
.200	.034	.324	1.421	1.700	1.281	.997	.016
.250	.052	.392	1.324	1.750	1.331	.998	.013
.300	.073	.456	1.228	1.800	1.381	.998	.010
.350	.097	.515	1.135	1.850	1.431	.999	.008
.400	.124	.570	1.045	1.900	1.481	.999	.006
.450	.154	.620	.957	1.950	1.531	.999	.004
.500	.186	.665	.872	2.000	1.581	.999	.003
.550	.220	.707	.791	2.050	1.631	1.000	.003
.600	.257	.745	.714	2.100	1.681	1.000	.002
.650	.295	.778	.641	2.150	1.731	1.000	.001
.700	.335	.809	.573	2.200	1.781	1.000	.001
.750	.376	.836	.509	2.250	1.831	1.000	.001
.800	.418	.860	.449	2.300	1.881	1.000	.001
.850	.462	.881	.395	2.350	1.931	1.000	.000
.900	.506	.899	.344	2.400	1.981	1.000	.000
.950	.551	.915	.299	2.450	2.031	1.000	.000
1.000	.598	.929	.258	2.500	2.081	1.000	.000
1.050	.644	.941	.221	2.550	2.131	1.000	.000
1.100	.692	.951	.188	2.600	2.181	1.000	.000
1.150	.739	.960	.159	2.650	2.231	1.000	.000
1.200	.788	.967	.134	2.700	2.281	1.000	.000
1.250	.836	.973	.112	2.750	2.331	1.000	.000
1.300	.885	.979	.093	2.800	2.381	1.000	.000
1.350	.934	.983	.077	2.850	2.431	1.000	.000
1.400	.983	.986	.063	2.900	2.481	1.000	.000
1.450	1.033	.989	.051	2.950	2.531	1.000	.000
				3.000	2.581	1.000	.000

TABLE II. - Continued. NUMERICAL SOLUTION TO CASE II ($U = ax^n z^{m-1}$, $W = bx^{n-1} z^m$)

(16) $p = 2$, $n = 3$, and $m = 1$

(a) Tabulation of $F(\eta)$ and derivatives

η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$	η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$
0.000	0.000	0.000	2.188	1.500	1.146	0.997	0.016
.050	.003	.106	2.038	1.550	1.196	.998	.012
.100	.010	.204	1.890	1.600	1.246	.999	.009
.150	.023	.295	1.743	1.650	1.296	.999	.006
.200	.040	.378	1.599	1.700	1.345	.999	.005
.250	.061	.455	1.459	1.750	1.395	1.000	.003
.300	.085	.524	1.324	1.800	1.445	1.000	.002
.350	.113	.587	1.195	1.850	1.495	1.000	.002
.400	.144	.644	1.071	1.900	1.545	1.000	.001
.450	.177	.694	.955	1.950	1.595	1.000	.001
.500	.213	.739	.845	2.000	1.645	1.000	.001
.550	.251	.779	.744	2.050	1.695	1.000	.000
.600	.291	.814	.650	2.100	1.745	1.000	.000
.650	.332	.844	.564	2.150	1.795	1.000	.000
.700	.375	.870	.486	2.200	1.845	1.000	.000
.750	.419	.893	.416	2.250	1.895	1.000	.000
.800	.465	.912	.353	2.300	1.945	1.000	.000
.850	.511	.928	.298	2.350	1.995	1.000	.000
.900	.557	.942	.249	2.400	2.045	1.000	.000
.950	.605	.953	.207	2.450	2.095	1.000	.000
1.000	.653	.963	.171	2.500	2.145	1.000	.000
1.050	.701	.971	.139	2.550	2.195	1.000	.000
1.100	.750	.977	.113	2.600	2.245	1.000	.000
1.150	.799	.982	.091	2.650	2.295	1.000	.000
1.200	.848	.986	.073	2.700	2.345	1.000	.000
1.250	.897	.989	.057	2.750	2.395	1.000	.000
1.300	.947	.992	.045	2.800	2.445	1.000	.000
1.350	.996	.994	.035	2.850	2.495	1.000	.000
1.400	1.046	.995	.027	2.900	2.545	1.000	.000
1.450	1.096	.997	.021	2.950	2.595	1.000	.000
				3.000	2.645	1.000	.000

(b) Tabulation of $G(\eta)$ and derivatives

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	2.473	1.500	1.179	0.999	0.009
.050	.003	.119	2.274	1.550	1.228	.999	.007
.100	.012	.227	2.077	1.600	1.278	.999	.005
.150	.026	.326	1.885	1.650	1.328	1.000	.004
.200	.044	.416	1.700	1.700	1.378	1.000	.003
.250	.067	.497	1.523	1.750	1.428	1.000	.002
.300	.094	.568	1.356	1.800	1.478	1.000	.001
.350	.124	.632	1.199	1.850	1.528	1.000	.001
.400	.157	.689	1.053	1.900	1.578	1.000	.001
.450	.192	.738	.919	1.950	1.628	1.000	.000
.500	.230	.781	.797	2.000	1.678	1.000	.000
.550	.270	.818	.686	2.050	1.728	1.000	.000
.600	.312	.849	.586	2.100	1.778	1.000	.000
.650	.355	.876	.497	2.150	1.828	1.000	.000
.700	.400	.899	.419	2.200	1.878	1.000	.000
.750	.445	.918	.350	2.250	1.928	1.000	.000
.800	.491	.934	.291	2.300	1.978	1.000	.000
.850	.539	.948	.240	2.350	2.028	1.000	.000
.900	.586	.959	.196	2.400	2.078	1.000	.000
.950	.634	.967	.159	2.450	2.128	1.000	.000
1.000	.683	.975	.128	2.500	2.178	1.000	.000
1.050	.732	.980	.102	2.550	2.228	1.000	.000
1.100	.781	.985	.081	2.600	2.278	1.000	.000
1.150	.830	.988	.064	2.650	2.328	1.000	.000
1.200	.880	.991	.050	2.700	2.378	1.000	.000
1.250	.929	.993	.038	2.750	2.428	1.000	.000
1.300	.979	.995	.029	2.800	2.478	1.000	.000
1.350	1.029	.996	.022	2.850	2.528	1.000	.000
1.400	1.079	.997	.017	2.900	2.578	1.000	.000
1.450	1.129	.998	.013	2.950	2.628	1.000	.000
				3.000	2.678	1.000	.000

TABLE II. - Continued. NUMERICAL SOLUTION TO CASE II ($U = ax^n z^{m-1}$, $W = bx^{n-1}z^m$)

(17) $p = 2$, $n = 3$, and $m = 3$

(a) Tabulation of $F(\eta)$ and derivatives

η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$	η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$
0.000	0.000	0.000	3.225	1.000	0.749	0.993	0.046
.025	.001	.078	3.050	1.025	.774	.994	.039
.050	.004	.153	2.876	1.050	.799	.995	.033
.075	.009	.222	2.705	1.075	.824	.996	.028
.100	.015	.288	2.537	1.100	.849	.997	.024
.125	.023	.349	2.373	1.125	.874	.997	.020
.150	.032	.406	2.214	1.150	.899	.998	.017
.175	.043	.460	2.061	1.175	.924	.998	.014
.200	.055	.510	1.913	1.200	.949	.999	.012
.225	.069	.556	1.771	1.225	.974	.999	.010
.250	.083	.598	1.636	1.250	.999	.999	.008
.275	.099	.637	1.507	1.275	1.024	.999	.007
.300	.115	.674	1.385	1.300	1.049	.999	.006
.325	.132	.707	1.270	1.325	1.074	.999	.005
.350	.150	.737	1.162	1.350	1.099	1.000	.004
.375	.169	.765	1.060	1.375	1.124	1.000	.003
.400	.188	.790	.965	1.400	1.149	1.000	.002
.425	.209	.813	.876	1.425	1.174	1.000	.002
.450	.229	.834	.793	1.450	1.199	1.000	.002
.475	.250	.853	.717	1.475	1.224	1.000	.001
.500	.272	.870	.646	1.500	1.249	1.000	.001
.525	.294	.885	.580	1.525	1.274	1.000	.001
.550	.316	.899	.520	1.550	1.299	1.000	.001
.575	.339	.911	.465	1.575	1.324	1.000	.001
.600	.362	.922	.415	1.600	1.349	1.000	.000
.625	.385	.932	.369	1.625	1.374	1.000	.000
.650	.408	.941	.328	1.650	1.399	1.000	.000
.675	.432	.949	.290	1.675	1.424	1.000	.000
.700	.456	.955	.256	1.700	1.449	1.000	.000
.725	.480	.961	.226	1.725	1.474	1.000	.000
.750	.504	.967	.198	1.750	1.499	1.000	.000
.775	.528	.971	.173	1.775	1.524	1.000	.000
.800	.552	.975	.151	1.800	1.549	1.000	.000
.825	.577	.979	.132	1.825	1.574	1.000	.000
.850	.601	.982	.115	1.850	1.599	1.000	.000
.875	.626	.985	.099	1.875	1.624	1.000	.000
.900	.650	.987	.086	1.900	1.649	1.000	.000
.925	.675	.989	.074	1.925	1.674	1.000	.000
.950	.700	.991	.063	1.950	1.699	1.000	.000
.975	.725	.992	.054	1.975	1.724	1.000	.000
				2.000	1.749	1.000	.000

(b) Tabulation of $G(\eta)$ and derivatives

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	3.433	1.000	0.763	0.995	0.035
.025	.001	.083	3.234	1.025	.788	.996	.030
.050	.004	.162	3.036	1.050	.813	.997	.025
.075	.009	.235	2.841	1.075	.838	.997	.021
.100	.016	.304	2.650	1.100	.863	.998	.017
.125	.024	.368	2.465	1.125	.888	.998	.015
.150	.034	.427	2.286	1.150	.912	.999	.012
.175	.046	.482	2.114	1.175	.937	.999	.010
.200	.058	.533	1.950	1.200	.962	.999	.008
.225	.072	.580	1.793	1.225	.987	.999	.007
.250	.087	.623	1.645	1.250	1.012	.999	.006
.275	.103	.662	1.504	1.275	1.037	.999	.005
.300	.120	.698	1.373	1.300	1.062	1.000	.004
.325	.138	.731	1.249	1.325	1.087	1.000	.003
.350	.157	.760	1.133	1.350	1.112	1.000	.002
.375	.176	.787	1.026	1.375	1.137	1.000	.002
.400	.196	.812	.926	1.400	1.162	1.000	.002
.425	.217	.834	.834	1.425	1.187	1.000	.001
.450	.238	.853	.749	1.450	1.212	1.000	.001
.475	.259	.871	.670	1.475	1.237	1.000	.001
.500	.281	.887	.599	1.500	1.262	1.000	.001
.525	.304	.901	.534	1.525	1.287	1.000	.001
.550	.326	.914	.474	1.550	1.312	1.000	.000
.575	.349	.925	.420	1.575	1.337	1.000	.000
.600	.373	.935	.371	1.600	1.362	1.000	.000
.625	.396	.944	.327	1.625	1.387	1.000	.000
.650	.420	.951	.288	1.650	1.412	1.000	.000
.675	.444	.958	.252	1.675	1.437	1.000	.000
.700	.468	.964	.221	1.700	1.462	1.000	.000
.725	.492	.969	.192	1.725	1.487	1.000	.000
.750	.516	.974	.167	1.750	1.512	1.000	.000
.775	.541	.977	.143	1.775	1.537	1.000	.000
.800	.565	.981	.125	1.800	1.562	1.000	.000
.825	.590	.984	.108	1.825	1.587	1.000	.000
.850	.614	.986	.093	1.850	1.612	1.000	.000
.875	.639	.988	.080	1.875	1.637	1.000	.000
.900	.664	.990	.068	1.900	1.662	1.000	.000
.925	.688	.992	.058	1.925	1.687	1.000	.000
.950	.713	.993	.049	1.950	1.712	1.000	.000
.975	.738	.994	.042	1.975	1.737	1.000	.000
				2.000	1.762	1.000	.000

TABLE II. - Continued. NUMERICAL SOLUTION TO CASE II ($U = ax^n z^{m-1}$, $W = bx^{n-1} z^m$)

(18) $p = 2$, $n = 3$, and $m = 5$

(a) Tabulation of $F(\eta)$ and derivatives

η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$	η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$
0.000	0.000	0.000	4.007	1.000	0.795	0.998	0.014
.025	.001	.097	3.733	1.025	.820	.999	.011
.050	.005	.187	3.462	1.050	.845	.999	.009
.075	.011	.270	3.197	1.075	.870	.999	.007
.100	.018	.347	2.940	1.100	.895	.999	.006
.125	.028	.417	2.693	1.125	.920	1.000	.005
.150	.039	.481	2.457	1.150	.945	1.000	.004
.175	.052	.540	2.234	1.175	.970	1.000	.003
.200	.066	.593	2.024	1.200	.995	1.000	.002
.225	.081	.641	1.827	1.225	1.020	1.000	.002
.250	.098	.685	1.644	1.250	1.045	1.000	.001
.275	.116	.724	1.473	1.275	1.070	1.000	.001
.300	.134	.758	1.316	1.300	1.095	1.000	.001
.325	.153	.789	1.172	1.325	1.120	1.000	.001
.350	.174	.817	1.040	1.350	1.145	1.000	.000
.375	.194	.842	.920	1.375	1.170	1.000	.000
.400	.216	.863	.811	1.400	1.195	1.000	.000
.425	.237	.882	.713	1.425	1.220	1.000	.000
.450	.260	.899	.624	1.450	1.245	1.000	.000
.475	.282	.914	.545	1.475	1.270	1.000	.000
.500	.305	.926	.474	1.500	1.295	1.000	.000
.525	.329	.937	.411	1.525	1.320	1.000	.000
.550	.352	.947	.355	1.550	1.345	1.000	.000
.575	.376	.955	.306	1.575	1.370	1.000	.000
.600	.400	.962	.262	1.600	1.395	1.000	.000
.625	.424	.968	.224	1.625	1.420	1.000	.000
.650	.448	.973	.191	1.650	1.445	1.000	.000
.675	.473	.978	.162	1.675	1.470	1.000	.000
.700	.497	.982	.137	1.700	1.495	1.000	.000
.725	.522	.985	.116	1.725	1.520	1.000	.000
.750	.547	.987	.097	1.750	1.545	1.000	.000
.775	.571	.990	.082	1.775	1.570	1.000	.000
.800	.596	.992	.068	1.800	1.595	1.000	.000
.825	.621	.993	.056	1.825	1.620	1.000	.000
.850	.646	.994	.047	1.850	1.645	1.000	.000
.875	.671	.995	.039	1.875	1.670	1.000	.000
.900	.695	.996	.032	1.900	1.695	1.000	.000
.925	.720	.997	.026	1.925	1.720	1.000	.000
.950	.745	.998	.021	1.950	1.745	1.000	.000
.975	.770	.998	.017	1.975	1.770	1.000	.000
				2.000	1.795	1.000	.000

(b) Tabulation of $G(\eta)$ and derivatives

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	4.180	1.000	0.803	0.999	0.011
.025	.001	.101	3.881	1.025	.828	.999	.009
.050	.005	.194	3.585	1.050	.853	.999	.007
.075	.011	.280	3.297	1.075	.878	.999	.005
.100	.019	.359	3.019	1.100	.903	1.000	.004
.125	.029	.431	2.752	1.125	.928	1.000	.003
.150	.040	.497	2.499	1.150	.953	1.000	.003
.175	.054	.556	2.259	1.175	.978	1.000	.002
.200	.068	.610	2.035	1.200	1.003	1.000	.002
.225	.084	.658	1.827	1.225	1.028	1.000	.001
.250	.101	.701	1.633	1.250	1.053	1.000	.001
.275	.119	.740	1.455	1.275	1.078	1.000	.001
.300	.138	.774	1.291	1.300	1.103	1.000	.001
.325	.158	.805	1.142	1.325	1.128	1.000	.000
.350	.178	.831	1.007	1.350	1.153	1.000	.000
.375	.199	.855	.884	1.375	1.178	1.000	.000
.400	.221	.876	.774	1.400	1.203	1.000	.000
.425	.243	.894	.675	1.425	1.228	1.000	.000
.450	.266	.910	.587	1.450	1.253	1.000	.000
.475	.289	.923	.508	1.475	1.278	1.000	.000
.500	.312	.935	.438	1.500	1.303	1.000	.000
.525	.335	.945	.377	1.525	1.328	1.000	.000
.550	.359	.954	.323	1.550	1.353	1.000	.000
.575	.383	.961	.276	1.575	1.378	1.000	.000
.600	.407	.968	.235	1.600	1.403	1.000	.000
.625	.431	.973	.199	1.625	1.428	1.000	.000
.650	.456	.978	.168	1.650	1.453	1.000	.000
.675	.480	.982	.142	1.675	1.478	1.000	.000
.700	.505	.985	.119	1.700	1.503	1.000	.000
.725	.529	.988	.099	1.725	1.528	1.000	.000
.750	.554	.990	.083	1.750	1.553	1.000	.000
.775	.579	.992	.068	1.775	1.578	1.000	.000
.800	.604	.993	.057	1.800	1.603	1.000	.000
.825	.629	.995	.047	1.825	1.628	1.000	.000
.850	.653	.996	.038	1.850	1.653	1.000	.000
.875	.678	.996	.031	1.875	1.678	1.000	.000
.900	.703	.997	.025	1.900	1.703	1.000	.000
.925	.728	.998	.021	1.925	1.728	1.000	.000
.950	.753	.998	.017	1.950	1.753	1.000	.000
.975	.778	.999	.013	1.975	1.778	1.000	.000
				2.000	1.803	1.000	.000

TABLE II. - Continued. NUMERICAL SOLUTION TO CASE II ($U = ax^n z^{m-1}$, $W = bx^{n-1}z^m$)

(19) $p = 2$, $n = 5$, and $m = 0$

(a) Tabulation of $F(\eta)$ and derivatives

η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$	η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$
0.000	0.000	0.000	2.200	1.500	1.149	0.998	0.014
.050	.003	.106	2.050	1.550	1.199	.998	.011
.100	.011	.205	1.901	1.600	1.249	.999	.008
.150	.023	.296	1.754	1.650	1.299	.999	.006
.200	.040	.380	1.609	1.700	1.349	.999	.004
.250	.061	.457	1.468	1.750	1.399	1.000	.003
.300	.086	.527	1.332	1.800	1.449	1.000	.002
.350	.114	.591	1.201	1.850	1.499	1.000	.002
.400	.145	.648	1.075	1.900	1.549	1.000	.001
.450	.178	.698	.957	1.950	1.599	1.000	.001
.500	.214	.743	.846	2.000	1.649	1.000	.001
.550	.253	.783	.743	2.050	1.699	1.000	.000
.600	.293	.818	.648	2.100	1.749	1.000	.000
.650	.334	.848	.561	2.150	1.799	1.000	.000
.700	.377	.874	.482	2.200	1.849	1.000	.000
.750	.422	.896	.411	2.250	1.899	1.000	.000
.800	.467	.915	.348	2.300	1.949	1.000	.000
.850	.513	.931	.292	2.350	1.999	1.000	.000
.900	.560	.945	.243	2.400	2.049	1.000	.000
.950	.607	.956	.201	2.450	2.099	1.000	.000
1.000	.655	.965	.165	2.500	2.149	1.000	.000
1.050	.704	.972	.134	2.550	2.199	1.000	.000
1.100	.753	.978	.108	2.600	2.249	1.000	.000
1.150	.802	.983	.087	2.650	2.299	1.000	.000
1.200	.851	.987	.069	2.700	2.349	1.000	.000
1.250	.900	.990	.054	2.750	2.399	1.000	.000
1.300	.950	.992	.042	2.800	2.449	1.000	.000
1.350	1.000	.994	.033	2.850	2.499	1.000	.000
1.400	1.049	.996	.025	2.900	2.549	1.000	.000
1.450	1.099	.997	.019	2.950	2.599	1.000	.000
				3.000	2.649	1.000	.000

(b) Tabulation of $G(\eta)$ and derivatives

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	2.484	1.500	1.182	0.999	0.008
.050	.003	.119	2.285	1.550	1.231	.999	.006
.100	.012	.229	2.088	1.600	1.281	.999	.004
.150	.026	.328	1.895	1.650	1.331	1.000	.003
.200	.044	.418	1.709	1.700	1.381	1.000	.002
.250	.067	.499	1.531	1.750	1.431	1.000	.001
.300	.094	.571	1.362	1.800	1.481	1.000	.001
.350	.124	.636	1.204	1.850	1.531	1.000	.001
.400	.158	.692	1.057	1.900	1.581	1.000	.000
.450	.193	.741	.921	1.950	1.631	1.000	.000
.500	.232	.784	.797	2.000	1.681	1.000	.000
.550	.272	.821	.684	2.050	1.731	1.000	.000
.600	.314	.853	.584	2.100	1.781	1.000	.000
.650	.357	.880	.494	2.150	1.831	1.000	.000
.700	.402	.902	.415	2.200	1.881	1.000	.000
.750	.447	.921	.345	2.250	1.931	1.000	.000
.800	.494	.937	.286	2.300	1.981	1.000	.000
.850	.541	.950	.234	2.350	2.031	1.000	.000
.900	.589	.961	.190	2.400	2.081	1.000	.000
.950	.637	.969	.154	2.450	2.131	1.000	.000
1.000	.686	.976	.123	2.500	2.181	1.000	.000
1.050	.734	.982	.098	2.550	2.231	1.000	.000
1.100	.784	.986	.077	2.600	2.281	1.000	.000
1.150	.833	.989	.060	2.650	2.331	1.000	.000
1.200	.883	.992	.046	2.700	2.381	1.000	.000
1.250	.932	.994	.035	2.750	2.431	1.000	.000
1.300	.982	.996	.027	2.800	2.481	1.000	.000
1.350	1.032	.997	.020	2.850	2.531	1.000	.000
1.400	1.082	.998	.015	2.900	2.581	1.000	.000
1.450	1.132	.998	.011	2.950	2.631	1.000	.000
				3.000	2.681	1.000	.000

TABLE II. - Continued. NUMERICAL SOLUTION TO CASE II ($U = ax^n z^{m-1}$, $W = bx^{n-1}z^m$)

(20) $p = 2$, $n = 5$, and $m = 1$

(a) Tabulation of $F(\eta)$ and derivatives

η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$	η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$
0.000	0.000	0.000	2.760	1.000	0.713	0.986	0.085
.025	.001	.067	2.635	1.025	.738	.988	.075
.050	.003	.132	2.511	1.050	.763	.989	.065
.075	.007	.193	2.388	1.075	.787	.991	.057
.100	.013	.251	2.266	1.100	.812	.992	.049
.125	.020	.306	2.146	1.125	.837	.993	.043
.150	.028	.358	2.028	1.150	.862	.994	.037
.175	.038	.408	1.913	1.175	.887	.995	.032
.200	.049	.454	1.801	1.200	.912	.996	.027
.225	.061	.498	1.692	1.225	.937	.997	.023
.250	.073	.539	1.587	1.250	.961	.997	.020
.275	.087	.577	1.485	1.275	.986	.998	.017
.300	.102	.613	1.387	1.300	1.011	.998	.015
.325	.118	.647	1.293	1.325	1.036	.998	.012
.350	.135	.678	1.202	1.350	1.061	.999	.010
.375	.152	.707	1.116	1.375	1.086	.999	.009
.400	.170	.734	1.034	1.400	1.111	.999	.007
.425	.189	.758	.956	1.425	1.136	.999	.006
.450	.208	.781	.882	1.450	1.161	.999	.005
.475	.228	.803	.812	1.475	1.186	.999	.004
.500	.248	.822	.746	1.500	1.211	1.000	.004
.525	.269	.840	.683	1.525	1.236	1.000	.003
.550	.290	.856	.625	1.550	1.261	1.000	.003
.575	.312	.871	.571	1.575	1.286	1.000	.002
.600	.334	.885	.520	1.600	1.311	1.000	.002
.625	.356	.897	.472	1.625	1.336	1.000	.001
.650	.378	.908	.428	1.650	1.361	1.000	.001
.675	.401	.919	.387	1.675	1.386	1.000	.001
.700	.424	.928	.350	1.700	1.411	1.000	.001
.725	.448	.936	.315	1.725	1.436	1.000	.001
.750	.471	.944	.283	1.750	1.461	1.000	.001
.775	.495	.950	.254	1.775	1.486	1.000	.000
.800	.519	.956	.227	1.800	1.511	1.000	.000
.825	.543	.962	.202	1.825	1.536	1.000	.000
.850	.567	.966	.180	1.850	1.561	1.000	.000
.875	.591	.971	.160	1.875	1.586	1.000	.000
.900	.615	.974	.142	1.900	1.611	1.000	.000
.925	.640	.978	.125	1.925	1.636	1.000	.000
.950	.664	.981	.110	1.950	1.661	1.000	.000
.975	.689	.983	.097	1.975	1.686	1.000	.000
				2.000	1.711	1.000	.000

(b) Tabulation of $G(\eta)$ and derivatives

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	2.998	1.000	0.732	0.990	0.064
.025	.001	.079	2.848	1.025	.757	.991	.055
.050	.004	.142	2.699	1.050	.782	.993	.048
.075	.008	.208	2.552	1.075	.807	.994	.041
.100	.014	.270	2.407	1.100	.832	.995	.035
.125	.021	.328	2.265	1.125	.857	.996	.030
.150	.030	.383	2.126	1.150	.881	.996	.026
.175	.041	.435	1.992	1.175	.906	.997	.022
.200	.052	.483	1.861	1.200	.931	.997	.019
.225	.065	.528	1.736	1.225	.956	.998	.016
.250	.078	.570	1.615	1.250	.981	.998	.013
.275	.093	.609	1.499	1.275	1.006	.998	.011
.300	.109	.645	1.389	1.300	1.031	.999	.009
.325	.125	.678	1.283	1.325	1.056	.999	.008
.350	.143	.709	1.183	1.350	1.081	.999	.007
.375	.161	.737	1.089	1.375	1.106	.999	.006
.400	.180	.763	1.000	1.400	1.131	.999	.005
.425	.199	.787	.916	1.425	1.156	1.000	.004
.450	.219	.809	.837	1.450	1.181	1.000	.003
.475	.239	.829	.763	1.475	1.206	1.000	.003
.500	.260	.847	.695	1.500	1.231	1.000	.002
.525	.282	.864	.630	1.525	1.256	1.000	.002
.550	.304	.879	.571	1.550	1.281	1.000	.001
.575	.326	.893	.516	1.575	1.306	1.000	.001
.600	.348	.905	.465	1.600	1.331	1.000	.001
.625	.371	.916	.419	1.625	1.356	1.000	.001
.650	.394	.926	.376	1.650	1.381	1.000	.001
.675	.417	.935	.336	1.675	1.406	1.000	.000
.700	.441	.943	.300	1.700	1.431	1.000	.000
.725	.464	.950	.268	1.725	1.456	1.000	.000
.750	.488	.956	.238	1.750	1.481	1.000	.000
.775	.512	.962	.211	1.775	1.506	1.000	.000
.800	.536	.967	.187	1.800	1.531	1.000	.000
.825	.561	.971	.165	1.825	1.556	1.000	.000
.850	.585	.975	.145	1.850	1.581	1.000	.000
.875	.609	.978	.127	1.875	1.606	1.000	.000
.900	.634	.981	.112	1.900	1.631	1.000	.000
.925	.658	.984	.098	1.925	1.656	1.000	.000
.950	.683	.986	.085	1.950	1.681	1.000	.000
.975	.708	.988	.074	1.975	1.706	1.000	.000
				2.000	1.731	1.000	.000

TABLE II. - Continued. NUMERICAL SOLUTION TO CASE II ($U = ax^n z^{m-1}$, $W = bx^{n-1}z^m$)

(21) $p = 2$, $n = 5$, and $m = 3$

(a) Tabulation of $F(\eta)$ and derivatives

η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$	η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$
0.000	0.000	0.000	3.640	1.000	0.776	0.997	0.025
.025	.001	.088	3.415	1.025	.801	.998	.020
.050	.004	.171	3.193	1.050	.826	.998	.017
.075	.010	.248	2.974	1.075	.851	.998	.014
.100	.017	.320	2.761	1.100	.876	.999	.011
.125	.026	.386	2.555	1.125	.901	.999	.009
.150	.036	.447	2.356	1.150	.926	.999	.007
.175	.048	.504	2.166	1.175	.951	.999	.006
.200	.061	.556	1.986	1.200	.976	.999	.005
.225	.076	.603	1.814	1.225	1.001	1.000	.004
.250	.091	.647	1.653	1.250	1.026	1.000	.003
.275	.108	.686	1.501	1.275	1.051	1.000	.003
.300	.126	.722	1.359	1.300	1.076	1.000	.002
.325	.144	.754	1.227	1.325	1.101	1.000	.002
.350	.163	.783	1.105	1.350	1.126	1.000	.001
.375	.183	.809	.992	1.375	1.151	1.000	.001
.400	.204	.833	.887	1.400	1.176	1.000	.001
.425	.225	.854	.792	1.425	1.201	1.000	.001
.450	.246	.872	.705	1.450	1.226	1.000	.000
.475	.268	.889	.625	1.475	1.251	1.000	.000
.500	.291	.904	.553	1.500	1.276	1.000	.000
.525	.314	.917	.487	1.525	1.301	1.000	.000
.550	.337	.928	.429	1.550	1.326	1.000	.000
.575	.360	.938	.376	1.575	1.351	1.000	.000
.600	.383	.947	.328	1.600	1.376	1.000	.000
.625	.407	.955	.286	1.625	1.401	1.000	.000
.650	.431	.961	.248	1.650	1.426	1.000	.000
.675	.455	.967	.215	1.675	1.451	1.000	.000
.700	.480	.972	.186	1.700	1.476	1.000	.000
.725	.504	.976	.160	1.725	1.501	1.000	.000
.750	.528	.980	.137	1.750	1.526	1.000	.000
.775	.553	.983	.117	1.775	1.551	1.000	.000
.800	.578	.986	.100	1.800	1.576	1.000	.000
.825	.602	.988	.085	1.825	1.601	1.000	.000
.850	.627	.990	.072	1.850	1.626	1.000	.000
.875	.652	.992	.061	1.875	1.651	1.000	.000
.900	.677	.993	.051	1.900	1.676	1.000	.000
.925	.701	.995	.043	1.925	1.701	1.000	.000
.950	.726	.995	.036	1.950	1.726	1.000	.000
.975	.751	.996	.030	1.975	1.751	1.000	.000
				2.000	1.776	1.000	.000

(b) Tabulation of $G(\eta)$ and derivatives

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	3.828	1.000	0.786	0.998	0.019
.025	.001	.093	3.579	1.025	.811	.998	.015
.050	.005	.179	3.332	1.050	.836	.999	.013
.075	.010	.259	3.090	1.075	.861	.999	.010
.100	.017	.333	2.855	1.100	.886	.999	.008
.125	.027	.402	2.628	1.125	.911	.999	.007
.150	.038	.465	2.410	1.150	.936	.999	.005
.175	.050	.523	2.203	1.175	.961	1.000	.004
.200	.064	.575	2.007	1.200	.986	1.000	.003
.225	.079	.623	1.823	1.225	1.011	1.000	.003
.250	.095	.666	1.650	1.250	1.036	1.000	.002
.275	.112	.706	1.488	1.275	1.061	1.000	.002
.300	.130	.741	1.338	1.300	1.086	1.000	.001
.325	.149	.773	1.200	1.325	1.111	1.000	.001
.350	.169	.801	1.072	1.350	1.136	1.000	.001
.375	.189	.826	.955	1.375	1.161	1.000	.001
.400	.210	.849	.848	1.400	1.186	1.000	.000
.425	.231	.869	.751	1.425	1.211	1.000	.000
.450	.253	.887	.663	1.450	1.236	1.000	.000
.475	.276	.902	.583	1.475	1.261	1.000	.000
.500	.298	.916	.512	1.500	1.286	1.000	.000
.525	.321	.928	.447	1.525	1.311	1.000	.000
.550	.345	.938	.390	1.550	1.336	1.000	.000
.575	.368	.947	.339	1.575	1.361	1.000	.000
.600	.392	.955	.293	1.600	1.386	1.000	.000
.625	.416	.962	.253	1.625	1.411	1.000	.000
.650	.440	.968	.218	1.650	1.436	1.000	.000
.675	.464	.973	.187	1.675	1.461	1.000	.000
.700	.489	.977	.160	1.700	1.486	1.000	.000
.725	.513	.981	.136	1.725	1.511	1.000	.000
.750	.538	.984	.116	1.750	1.536	1.000	.000
.775	.563	.987	.098	1.775	1.561	1.000	.000
.800	.587	.989	.083	1.800	1.586	1.000	.000
.825	.612	.991	.070	1.825	1.611	1.000	.000
.850	.637	.993	.058	1.850	1.636	1.000	.000
.875	.662	.994	.049	1.875	1.661	1.000	.000
.900	.686	.995	.041	1.900	1.686	1.000	.000
.925	.711	.996	.034	1.925	1.711	1.000	.000
.950	.736	.997	.028	1.950	1.736	1.000	.000
.975	.761	.997	.023	1.975	1.761	1.000	.000
				2.000	1.786	1.000	.000

TABLE II. - Concluded. NUMERICAL SOLUTION TO CASE II ($U = ax^n z^{m-1}$, $W = bx^{n-1}z^m$)

(22) $p = 2$, $n = 5$, and $m = 5$

(a) Tabulation of $F(\eta)$ and derivatives

η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$	η	$F(\eta)$	$F'(\eta)$	$F''(\eta)$
0.000	0.000	0.000	4.349	1.000	0.811	0.999	0.008
.025	.001	.105	4.025	1.025	.836	.999	.006
.050	.005	.201	3.705	1.050	.861	1.000	.005
.075	.011	.290	3.394	1.075	.886	1.000	.004
.100	.020	.371	3.094	1.100	.911	1.000	.003
.125	.030	.445	2.808	1.125	.936	1.000	.002
.150	.042	.512	2.537	1.150	.961	1.000	.002
.175	.055	.572	2.283	1.175	.986	1.000	.001
.200	.070	.626	2.045	1.200	1.011	1.000	.001
.225	.087	.674	1.825	1.225	1.036	1.000	.001
.250	.104	.717	1.622	1.250	1.061	1.000	.001
.275	.122	.755	1.436	1.275	1.086	1.000	.000
.300	.142	.789	1.267	1.300	1.111	1.000	.000
.325	.162	.819	1.113	1.325	1.136	1.000	.000
.350	.183	.845	.974	1.350	1.161	1.000	.000
.375	.204	.868	.849	1.375	1.186	1.000	.000
.400	.226	.888	.738	1.400	1.211	1.000	.000
.425	.248	.905	.638	1.425	1.236	1.000	.000
.450	.271	.920	.550	1.450	1.261	1.000	.000
.475	.294	.932	.473	1.475	1.286	1.000	.000
.500	.318	.943	.404	1.500	1.311	1.000	.000
.525	.342	.953	.345	1.525	1.336	1.000	.000
.550	.365	.961	.293	1.550	1.361	1.000	.000
.575	.390	.967	.247	1.575	1.386	1.000	.000
.600	.414	.973	.208	1.600	1.411	1.000	.000
.625	.438	.978	.175	1.625	1.436	1.000	.000
.650	.463	.982	.146	1.650	1.461	1.000	.000
.675	.487	.985	.122	1.675	1.486	1.000	.000
.700	.512	.988	.101	1.700	1.511	1.000	.000
.725	.537	.990	.083	1.725	1.536	1.000	.000
.750	.561	.992	.068	1.750	1.561	1.000	.000
.775	.586	.994	.056	1.775	1.586	1.000	.000
.800	.611	.995	.046	1.800	1.611	1.000	.000
.825	.636	.996	.037	1.825	1.636	1.000	.000
.850	.661	.997	.030	1.850	1.661	1.000	.000
.875	.686	.997	.024	1.875	1.686	1.000	.000
.900	.711	.998	.019	1.900	1.711	1.000	.000
.925	.736	.998	.015	1.925	1.736	1.000	.000
.950	.761	.999	.012	1.950	1.761	1.000	.000
.975	.786	.999	.010	1.975	1.786	1.000	.000
				2.000	1.811	1.000	.000

(b) Tabulation of $G(\eta)$ and derivatives

η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$	η	$G(\eta)$	$G'(\eta)$	$G''(\eta)$
0.000	0.000	0.000	4.509	1.000	0.817	0.999	0.006
.025	.001	.108	4.160	1.025	.842	1.000	.005
.050	.005	.208	3.817	1.050	.867	1.000	.004
.075	.012	.299	3.483	1.075	.892	1.000	.003
.100	.020	.382	3.162	1.100	.917	1.000	.002
.125	.031	.457	2.856	1.125	.942	1.000	.002
.150	.043	.525	2.568	1.150	.967	1.000	.001
.175	.057	.586	2.299	1.175	.992	1.000	.001
.200	.072	.640	2.049	1.200	1.017	1.000	.001
.225	.089	.689	1.818	1.225	1.042	1.000	.001
.250	.107	.731	1.607	1.250	1.067	1.000	.000
.275	.125	.769	1.414	1.275	1.092	1.000	.000
.300	.145	.802	1.239	1.300	1.117	1.000	.000
.325	.166	.831	1.082	1.325	1.142	1.000	.000
.350	.187	.857	.941	1.350	1.167	1.000	.000
.375	.208	.878	.815	1.375	1.192	1.000	.000
.400	.231	.897	.703	1.400	1.217	1.000	.000
.425	.253	.914	.604	1.425	1.242	1.000	.000
.450	.276	.928	.517	1.450	1.267	1.000	.000
.475	.300	.940	.440	1.475	1.292	1.000	.000
.500	.323	.950	.374	1.500	1.317	1.000	.000
.525	.347	.958	.316	1.525	1.342	1.000	.000
.550	.371	.966	.266	1.550	1.367	1.000	.000
.575	.395	.972	.223	1.575	1.392	1.000	.000
.600	.420	.977	.187	1.600	1.417	1.000	.000
.625	.444	.981	.155	1.625	1.442	1.000	.000
.650	.469	.985	.129	1.650	1.467	1.000	.000
.675	.493	.988	.106	1.675	1.492	1.000	.000
.700	.518	.990	.087	1.700	1.517	1.000	.000
.725	.543	.992	.071	1.725	1.542	1.000	.000
.750	.568	.994	.058	1.750	1.567	1.000	.000
.775	.593	.995	.047	1.775	1.592	1.000	.000
.800	.617	.996	.038	1.800	1.617	1.000	.000
.825	.642	.997	.031	1.825	1.642	1.000	.000
.850	.667	.997	.025	1.850	1.667	1.000	.000
.875	.692	.998	.020	1.875	1.692	1.000	.000
.900	.717	.998	.015	1.900	1.717	1.000	.000
.925	.742	.999	.012	1.925	1.742	1.000	.000
.950	.767	.999	.010	1.950	1.767	1.000	.000
.975	.792	.999	.008	1.975	1.792	1.000	.000
				2.000	1.817	1.000	.000

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TABLE III. - SUMMARY OF EIGENVALUES, RATIO OF EIGENVALUES, AND TABLE INDEX

Case I

n	m	F"(0)	G"(0)	$\frac{G''(0)}{F''(0)}$	Solutions listed in table -	n	m	F"(0)	G"(0)	$\frac{G''(0)}{F''(0)}$	Solutions listed in table -
0	0	0.33205801	0.33205801	1.0000000	I(1)	6	0	2.9383584	1.1175517	0.38033199	I(29)
	1		1.4180286	4.2704243	I(2)		1		1.4912850	.50752318	I(30)
	2		2.1971143	6.6166580	I(3)		2		1.8261230	.62147728	I(31)
	4		3.4501245	10.390126	I(4)		4		2.4173584	.82269011	I(32)
	6		4.50568198	13.568960	I(5)		6		2.9383584	1.0000000	I(33)
	8		5.44926954	16.410595	I(6)		8		3.4117643	1.1611124	I(34)
	10		6.31716707	19.024288	I(7)		10		3.8502869	1.3103531	I(35)
1	0	1.2325876	.57046526	.46281924	I(8)	8	0	3.3882993	1.2711033	.37514493	I(36)
	1		1.2325876	1.0000000	I(9)		1		1.6035898	.47327277	I(37)
	2		1.7480821	1.4182214	I(10)		2		1.9075416	.56297907	I(38)
	4		2.5897020	2.1010288	I(11)		4		2.4538180	.72420344	I(39)
	6		3.2999556	2.6772585	I(12)		6		2.9417263	.86820143	I(40)
	8		3.9339120	3.1915882	I(13)		8		3.3882993	1.0000000	I(41)
	10		4.5159800	3.6638207	I(14)		10		3.8037494	1.1226132	I(42)
2	0	1.7150676	.71607175	.41751809	I(15)	10	0	3.7851302	1.4079382	.37196559	I(43)
	1		1.2652246	.73771121	I(16)		1		1.7104632	.45189019	I(44)
	2		1.7150676	1.0000000	I(17)		2		1.9909028	.52598001	I(45)
	4		2.4647970	1.4371428	I(18)		4		2.5017160	.66093262	I(46)
	6		3.1030232	1.8092717	I(19)		6		2.9630576	.78281524	I(47)
	8		3.6742484	2.1423344	I(20)		8		3.3880884	.89510485	I(48)
	10		4.1992824	2.4484647	I(21)		10		3.7851302	1.0000000	I(49)
4	0	2.4057224	.93897044	.39030706	I(22)						
	1		1.3750248	.57156420	I(23)						
	2		1.7534514	.72886689	I(24)						
	4		2.4057224	1.0000000	I(25)						
	6		2.9712802	1.2350886	I(26)						
	8		3.4812041	1.4470515	I(27)						
	10		3.9515635	1.6425684	I(28)						

Case II

p	n+m	F"(0)	G"(0)	$\frac{G''(0)}{F''(0)}$	Solutions listed in table -	p	n	m	F"(0)	G"(0)	$\frac{G''(0)}{F''(0)}$	Solutions listed in table -
1	1	0.57514219	0.57514219	1.0	II(1)	2	0	1	0.81535508	1.3062116	1.6020157	II(9)
	2	1.3119376	1.3119376		II(2)			3	2.4730115	2.7318811	1.1046779	II(10)
	3	1.7712984	1.7712984		II(3)			5	3.4309556	3.6287362	1.0576459	II(11)
	4	2.1349036	2.1349036		II(4)		1	1	1.4115422	1.7916184	1.2692631	II(12)
	5	2.4452962	2.4452962		II(5)			3	2.7466290	2.9849798	1.0867794	II(13)
	6	2.7206142	2.7206142		II(6)			5	3.6334391	3.8216402	1.0517970	II(14)
	8	3.2011128	3.2011128		II(7)		3	0	1.4393410	1.8175671	1.2627773	II(15)
	10	3.6184272	3.6184272		II(8)			1	2.1883259	2.4732072	1.1301823	II(16)
								3	3.2246025	3.4333645	1.0647404	II(17)
								5	4.0074496	4.1800576	1.0430718	II(18)
							5	0	2.1999634	2.4843196	1.1292550	II(19)
								1	2.7601433	2.9980445	1.0861916	II(20)
								3	3.6400506	3.8281042	1.0516624	II(21)
								5	4.3490950	4.5094492	1.0368707	II(22)

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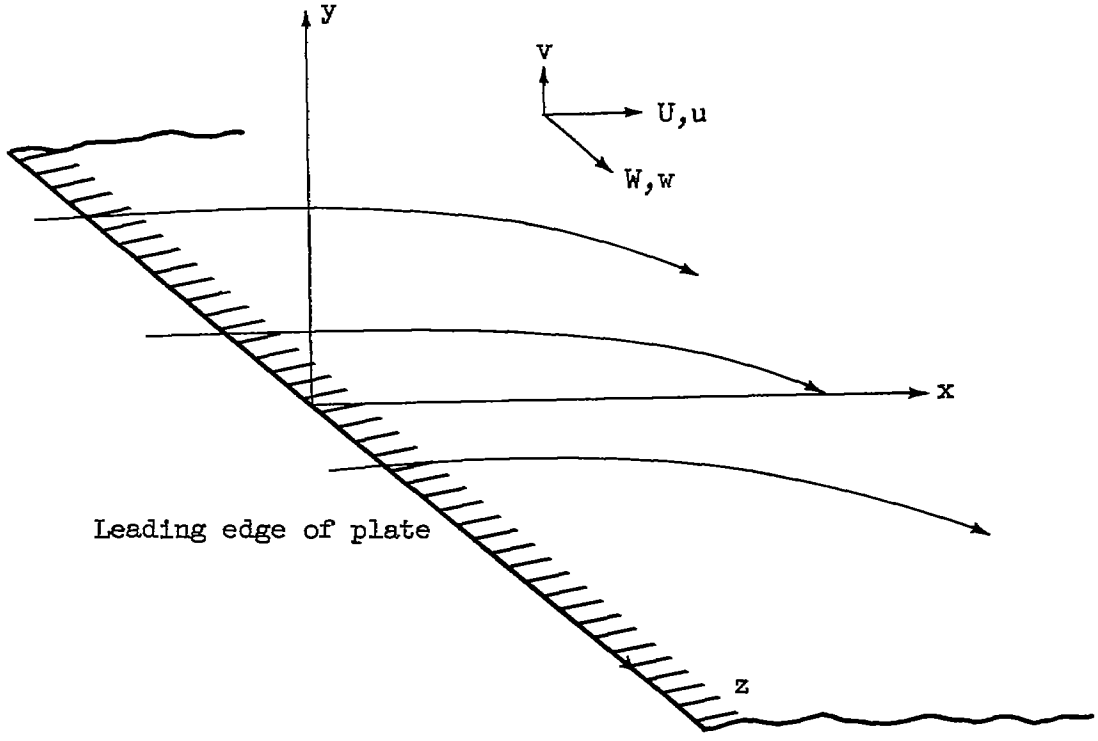

Figure 1. - Orientation of rectangular coordinates.

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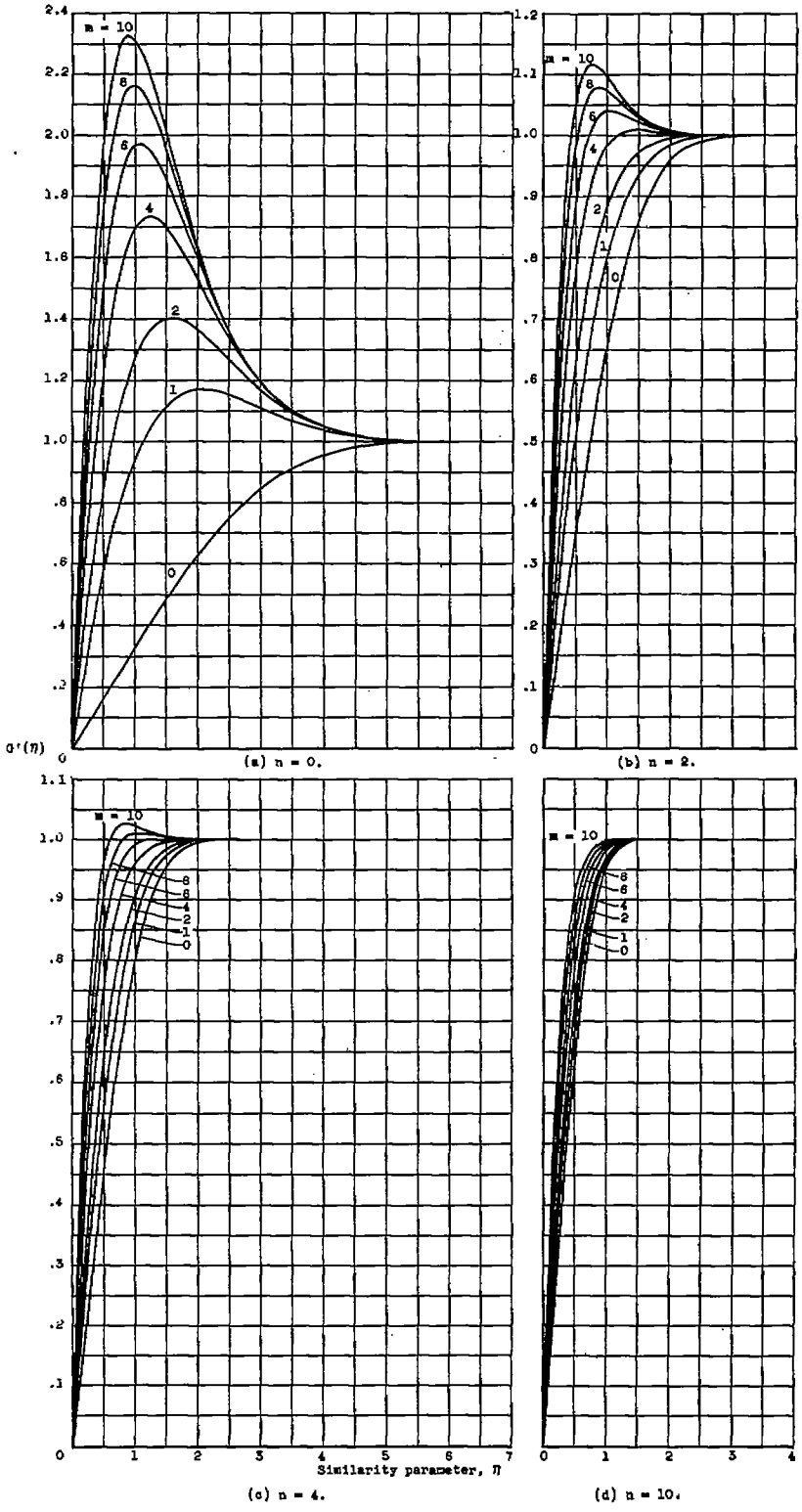

Figure 2. - Variation of solutions to Case I ($U = ax^n$, $W = bx^m$) with m.

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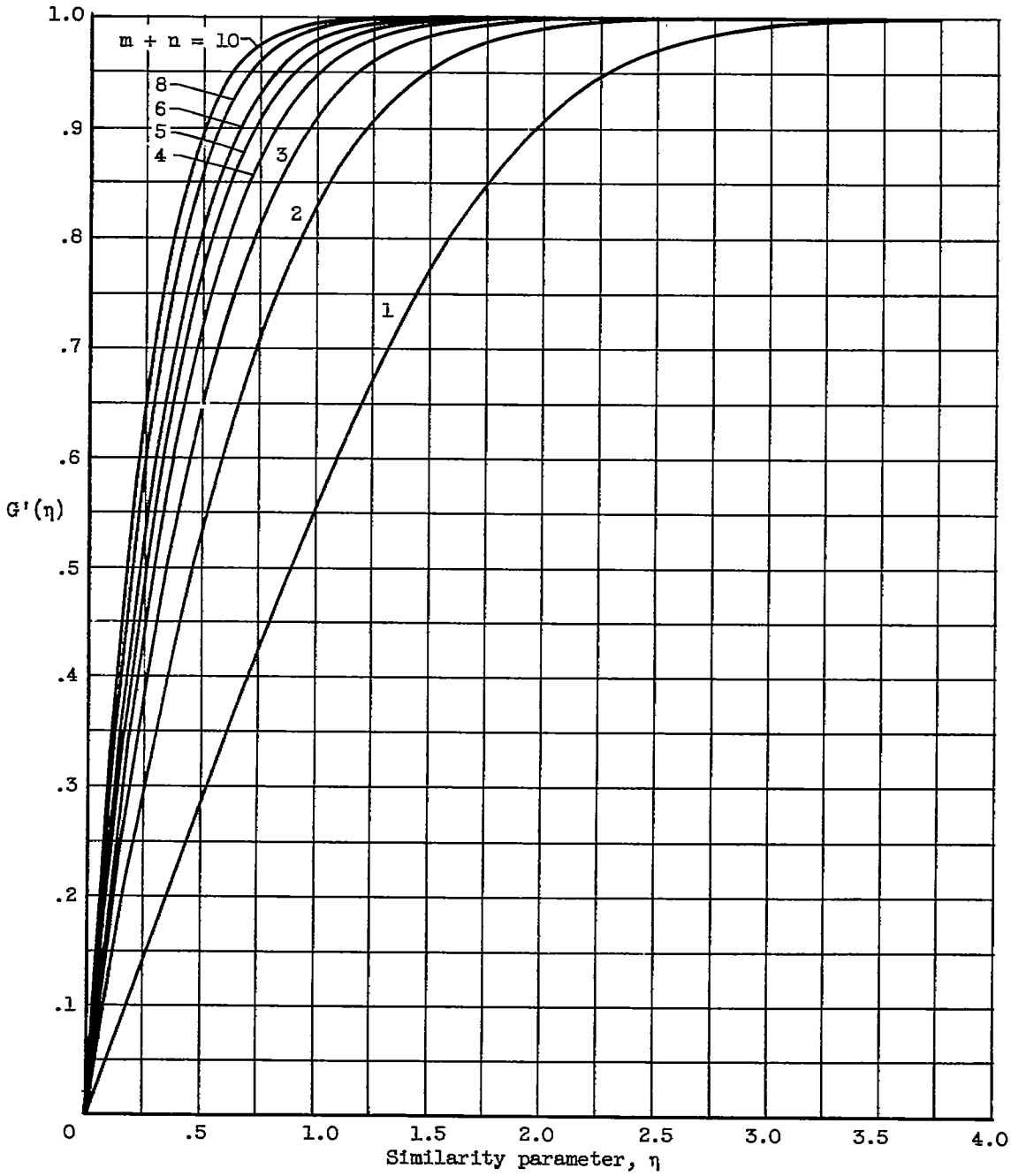


Figure 3. - Variation of solutions to Case II ($U = ax^n z^{m-1}$, $W = bx^{n-1}z^m$) with $m + n$, $p = 1$.

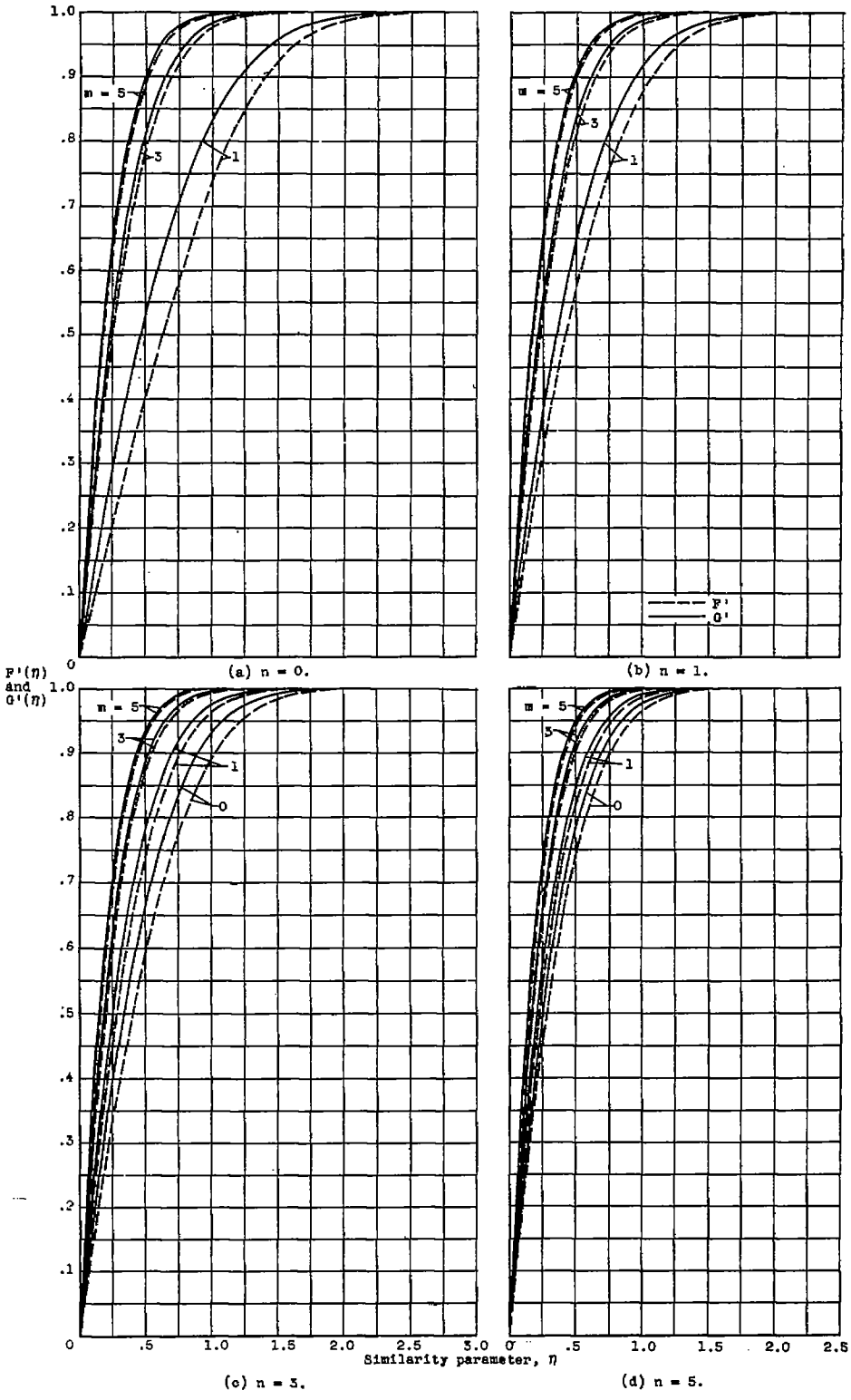


Figure 4. - Variation of solutions to Case II ($U = ax^n z^{m-1}$, $W = bx^{n-1}z^m$) with m, p = 2.

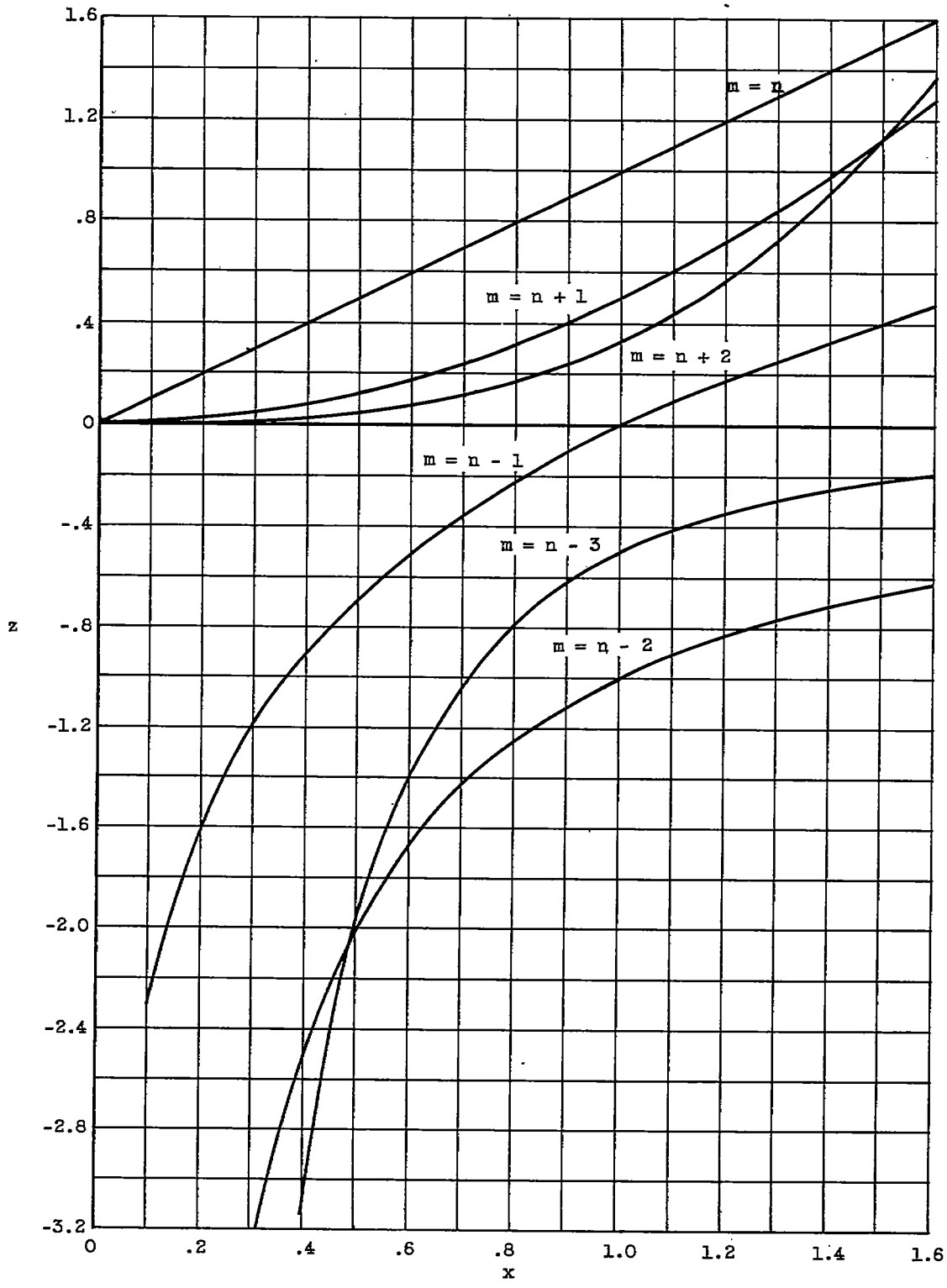


Figure 5. - Typical main-flow streamlines for Case I ($U = ax^n$, $W = bx^m$).

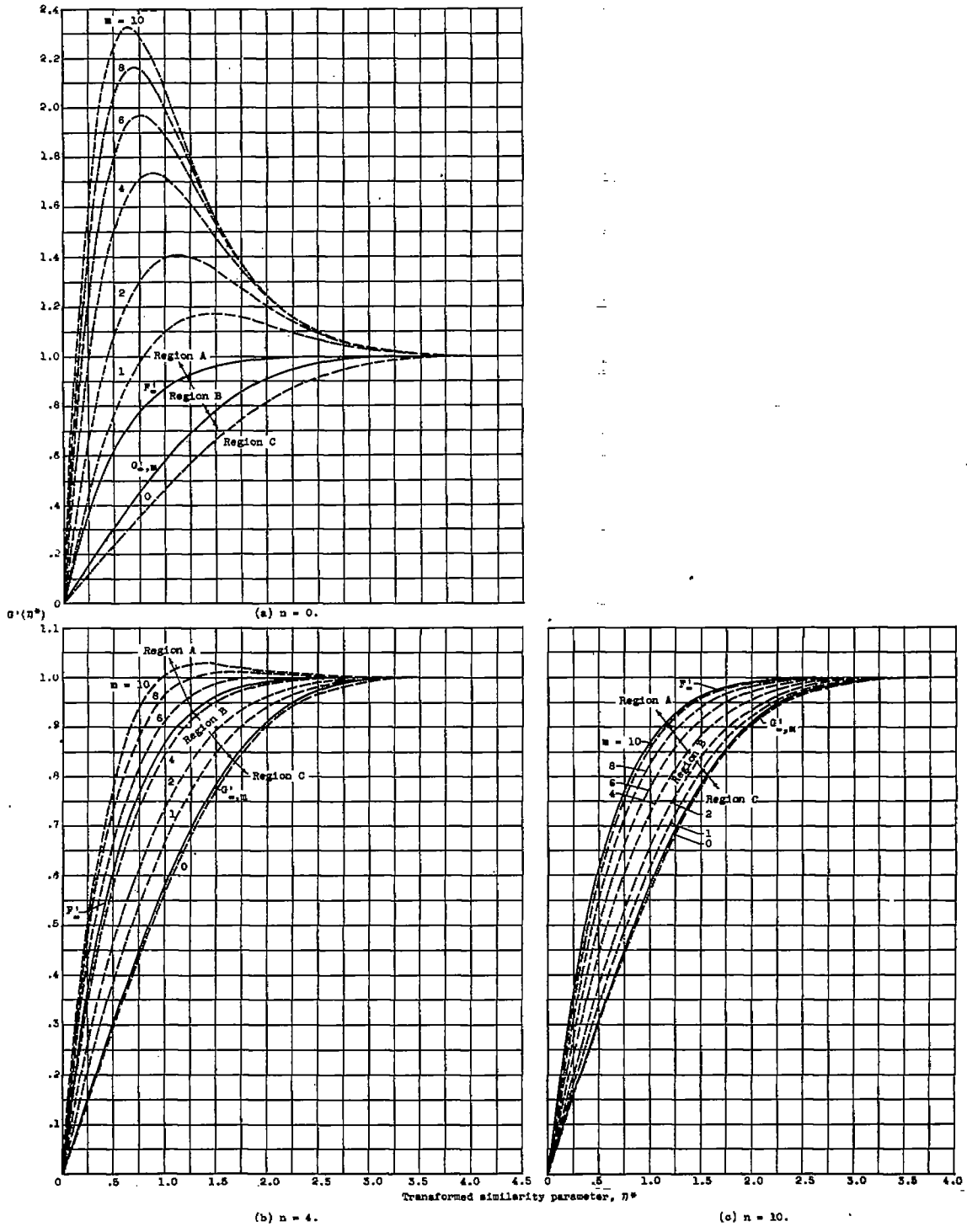
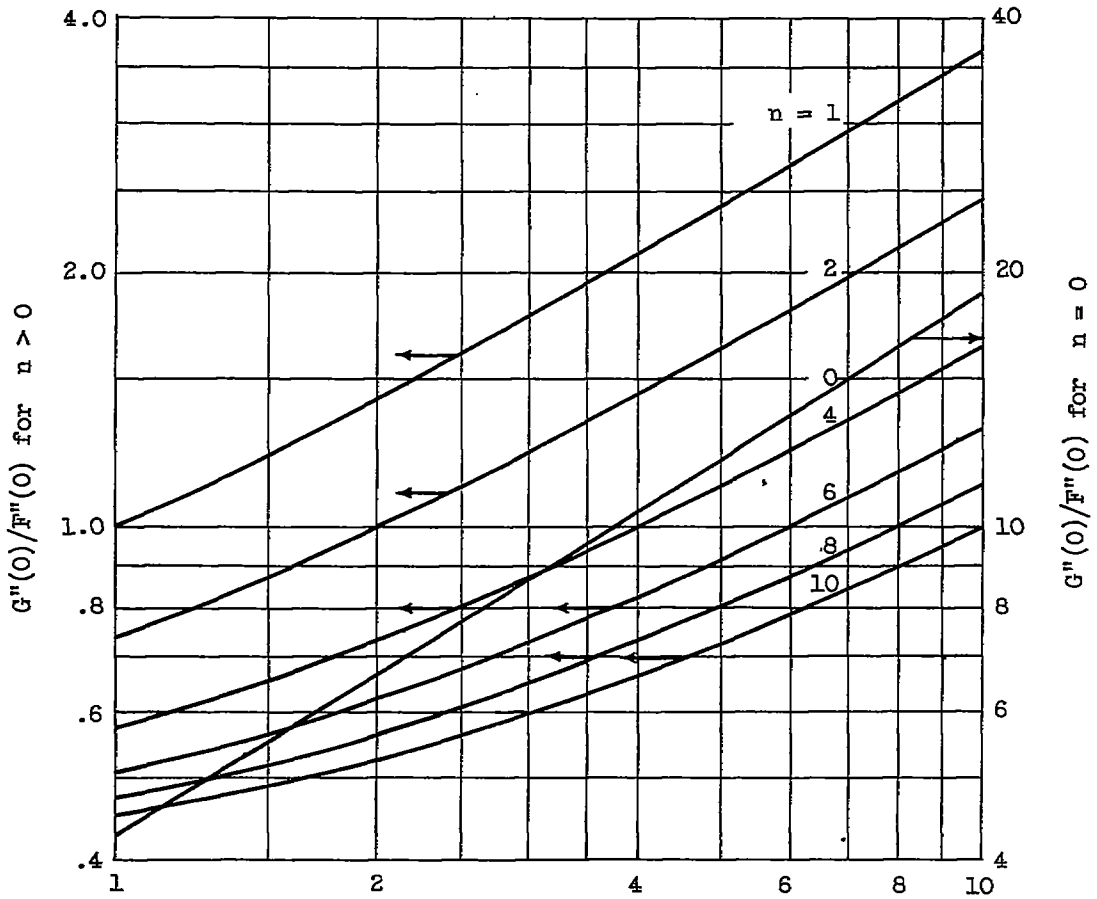
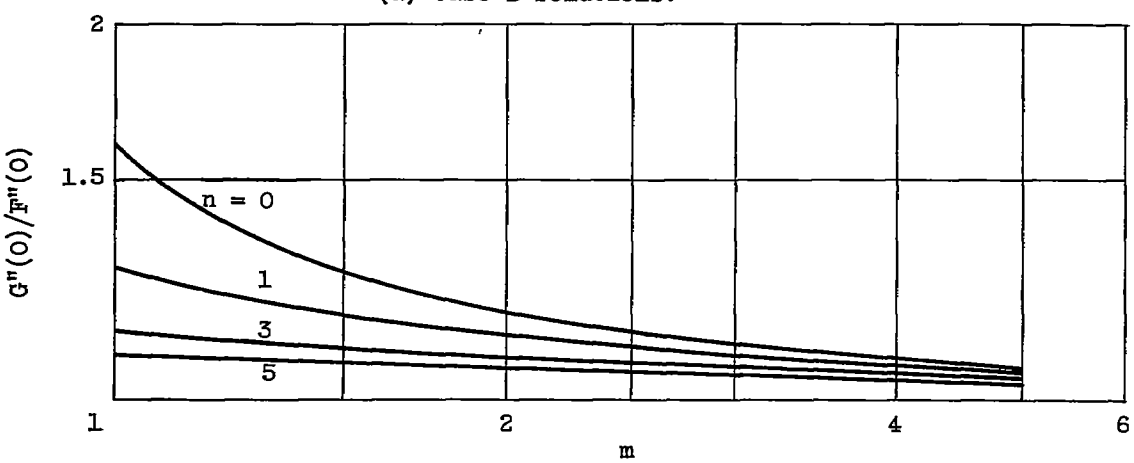


Figure 6. - Regional division of solutions to Case I.



(a) Case I solutions.



(b) Case II, p = 2, solutions.

Figure 7. - Variation of $G''(0)/F''(0)$ with m and n (except for $m = 0$).

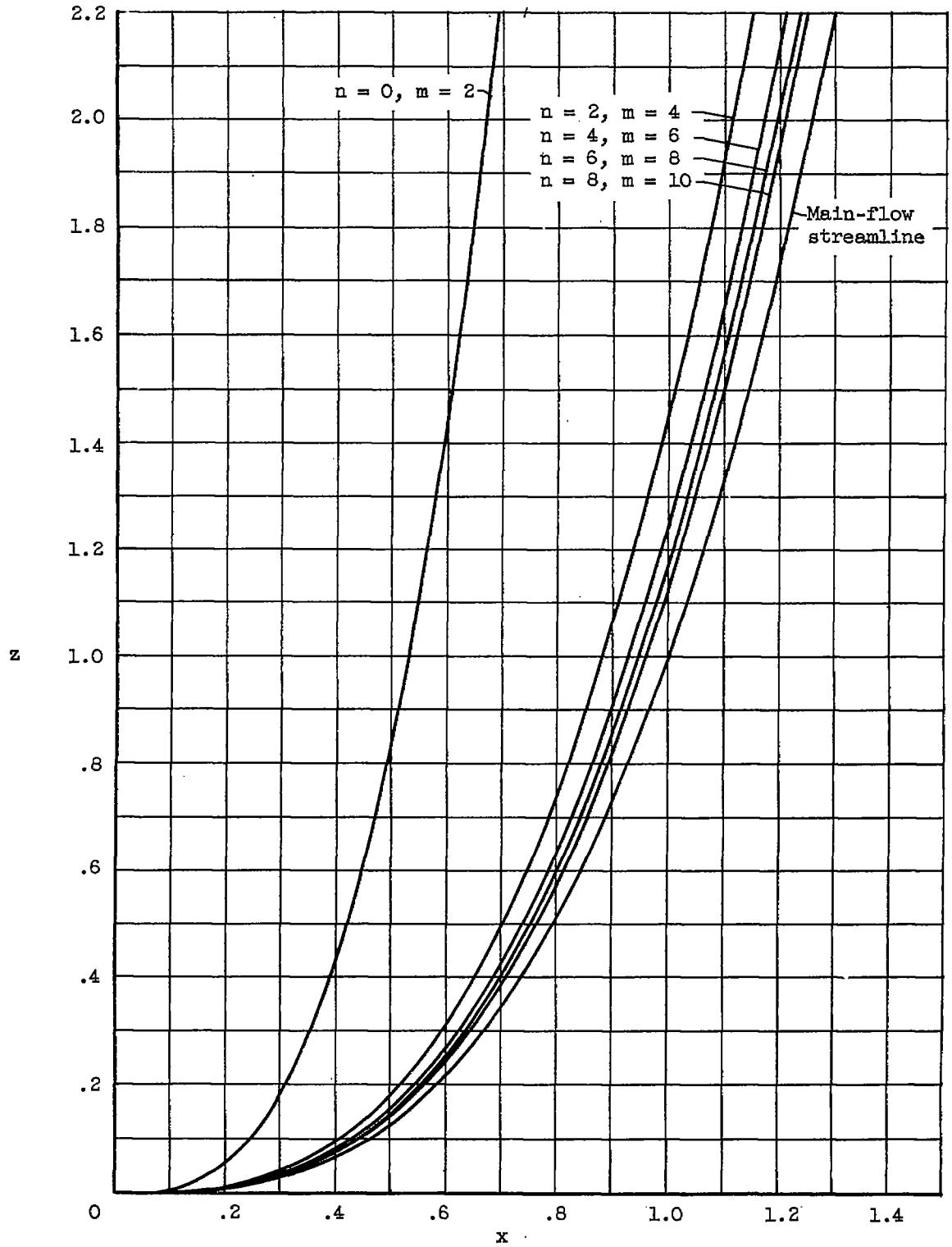


Figure 8. - Example of limiting streamlines for Case I.