II. Initial-Value Problems in Ordinary Differential Equations
III. Boundary-Value Problems in Ordinary Differential Equations
IV. Initial and Initial-Boundary-Value Problems in Partial Differential Equations
V. Boundary-Value Problems in Partial Differential Equations
VI. Integral and Functional Equations

The appendix contains a number of tables giving the various numerical methods in handy tabular form for both ordinary and partial differential equations.

This book is a translation of the second German edition with some differences. As the author states, "It differs in detail from the second edition in that throughout the book a large number of minor improvements, alterations and additions have been made, and numerous further references to the literature included; also new worked examples have been incorporated."

The book is large but by no means covers the subject completely, as the author is careful to point out in the preface. Professor Collatz also disclaims any attempt to make general critical comparisons of the various methods presented. This is to be regretted, since it decreases the value of the book to those persons who would be most likely to refer to it, namely the neophytes in this numerical field. Along this same line of criticism there is no mention made of the use of computers, either analog or digital, for the numerical solution of differential equations. This gives a new book a distinctly old-fashioned flavor. A specific example may be cited to illustrate the criticism. In Chapter II the author states that the Runge-Kutta and Adams methods are stable with respect to small random errors. However, he does not warn the reader as to which of the well-known methods are unstable. Thus, the uninitiated might be tempted to code an unstable method as a subroutine for a computer.

On the positive side, the book can be recommended for its vast coverage, its many worked examples, and its close attention to error estimates. The translation is smooth and the printing is excellent.

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92[H, X].—L. DERWIDUÉ, *Introduction à l'Algèbre Supérieure et au Calcul Numérique Algébrique*, Masson et Cie, Paris, 1957, 432 p., 25 cm. Price 6000 fr.

This author presents an interesting combination of pure theory and computational methods for linear and non-linear algebra—that is, linear equations, eigenvalues, roots of algebraic equations, etc. He concludes with an introduction to abstract algebra.

The numerical methods are developed for use with desk computers and are amply illustrated throughout the text. A listing of the chapter headings will indicate the scope of the work.

I. Mécanisation du calcul algébrique. Nombres complexes.
II. Les déterminants et les systèmes d'équations linéaires.
III. Théorie générale des polynômes et des fractions d'une indéterminée.
IV. Elimination et systèmes d'équations algébriques.
V. Résolution numérique des équations.

VI. Substitutions linéaires, formes quadratiques et transformations rationnelles.
VII. Calcul matriciel
VIII. Equations dont les racines sont dans un cercle ou un demi-plan. Critères de stabilité.
IX. Notion sur les groupes et sur l'algèbre abstraite.
Appendice Sur les determinants de Hurwitz et la séparation des racines complexes des équations à coefficients réels.

E. I.

93[H, X].—MINORU URABE, HIROKI YANAGIWARA & YOSHITANE SHINOHARA, "Periodic solutions of van der Pol's equation with damping coefficient $\lambda = 2 \sim 10$," reprinted from the *J. Sci. Hiroshima Univ.*, *Ser. A*, v. 23, No. 3, March 1960.

The periodic solution of van der Pol's equation

$$\frac{d\chi^2}{dt^2} - \lambda(1 - \chi^2)\frac{d\chi}{dt} + \chi = 0$$

is tabulated for $\lambda = 2, 3, 4, 5, 6, 8, 10$. For each λ a four-decimal-place listing of the function $\chi(t)$ and the function

$$y(t) = \begin{cases} \dfrac{d\chi}{dt} & \text{for } \lambda \leq 4 \\ \dfrac{d\chi}{dt}\Big/\lambda & \text{for } \lambda \geq 5 \end{cases}$$

is given for the range $T_1(a) \leqq t \leqq T_2(a)$, where a is the initial positive amplitude of the periodic solution normalized so that at $t = 0, \dfrac{d\chi}{dt} = 0$; and where $T_2(a)$ is the smallest positive time at which $\chi = 0$, while $T_1(a)$ is the largest negative time at which $\chi = 0$.

Since the periodic solution corresponds to a closed curve in the (χ, y) plane which is symmetric with respect to the origin, the above tabulation is sufficient.

For $\lambda \geq 5$, an additional three-decimal-place tabulation of $\dfrac{d\chi}{dt}$ is given.

The interval size in t depends on λ and on the value of t as in the following table:

λ	$t > 0$	$t < 0$
2	.05	.025
3, ··· , 8	.025	.0125
10	0.0(.0125)0.2 0.2(.025)9.0 9.0(.0125)9.25	.00625

Each table includes a listing of the same quantities at $t = T_1(a)$ and $t = T_2(a)$. Furthermore, four-decimal values of the amplitude a, the period ω =