The last part discusses Newton's method in n-dimensional space, and this is then applied to a second-order two-point boundary-value problem. In all cases we find very detailed discussions of the discretization errors and other numerical errors.

Each chapter has a generous number of exercises of varying degrees of complexity plus a useful bibliographical summary. Most of the methods are illustrated by examples and flow charts.

Apart from a few minor misprints, which do not mar the excellence of the presentation, we have only the following notes of criticism: The uninitiated reader should be prepared for a large variety of "errors" to be encountered. Apart from the usual discretization and round-off errors, of both the "local" and "genuine" variety, we find induced, adduced, inherent, starting, accumulated (both primary and secondary), and magnified errors. There is a tendency to couple and uncouple words such as stepnumber, which appears uncoupled in the index. The row sum given on p. 371 is evaluated on p. 375. It is not true, in general, that if algorithm (7–21) breaks down, then A is singular. Is there an extra hypothesis to be made in (7–74) that L_2 exists?

The text is otherwise carefully written and is a welcome addition to the growing body of literature on the analysis of finite-difference methods. This work will, I am sure, enlighten those interested in both discrete problems as well as non-discrete (or is it in-discrete) problems.

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30[M, X].—ALEKSANDR SEMENOVICH KRONROD, *Nodes and Weights of Quadrature Formulas*, Consultants Bureau, New York, 1965, vii + 143 pp., 28 cm. Price $12.50.

This book is a translation of a Russian book published in 1964. It contains tables of two types of quadrature formulas: Gauss-Legendre and so-called "improved" quadrature formulas.

The Gauss-Legendre formulas are the well-known approximations of the form

$$\int_0^1 f(x)\,dx \simeq \sum_{i=1}^{N} A_i f(\nu_i) \tag{1}$$

which are exact for all polynomials of degree $\leqq 2N - 1$. The A_i and ν_i in (1) are tabulated for $N = 1(1)40$.

Also tabulated are formulas of the form

$$\int_0^1 f(x)\,dx \simeq \sum_{i=1}^{N} A_i^* f(\nu_i) + \sum_{j=1}^{N+1} B_j f(\mu_j) \tag{2}$$

which are called improved formulas. In (2) the ν_i are the points in (1); the A_i^*, B_j and μ_j are chosen so that (2) is exact for all polynomials of the highest possible degree k; for N even, $k = 3N + 1$, and for N odd, $k = 3N + 2$. The constants in (2) are also given for $N = 1(1)40$. From the tables it is seen that the μ_j separate the ν_i, but no proof is given.

The constants in (1) and (2) are tabulated in two ways: to 16D and also in octal floating point to 16 significant octal places. Also given are auxiliary tables pertaining to the errors in (1) and (2). The tables comprise 133 pages.

To the reviewer's knowledge, this is the first place in which formulas (2) have been studied. They are proposed for the following reason: Suppose one has approximated an integral using (1) for a fixed N. Then by computing $N + 1$ additional values of the integrand one obtains a formula (2) of degree $3N + 1$ (or $3N + 2$) which serves as a check on (1). If one were to use an $(N + 1)$-point formula (1) as a check, this would only be a formula of degree $2N + 1$.

The reviewer, however, is not convinced of the value of checking by this method. What is gained by checking a formula of degree $2N - 1$ by one of degree $3N + 1$ instead of by one of degree $2n + 1$?

The introduction to the tables reproduces at least one error of the original Russian and has several added typographical errors. The displayed equations in the text and the tables are reproduced photographically from the original. The price seems about twice what would be necessary in a book of this nature.

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31[M, X].—Floyd E. Nixon, *Handbook of Laplace Transformation: Fundamentals, Applications, Tables, and Examples*, Second Edition, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1965, xii + 260 pp., 24 cm. Price $7.50.

This handbook is intended as a guide for those already familiar with the subject or as a text, albeit a short one, for the uninitiated. On both counts, it leaves much to be desired, and there are already available many references which are better by far. In the applications, knowledge of methods for finding the roots of polynomials are essential. This subject is taken up in Chapter 2. For the solution of equations or order higher than four, the author's only suggestion is an iterative method due to S. Lin. The discussion is woefully inadequate, as there is no discussion of convergence. In fact, the procedure does not always converge; and if it converges, the convergence is usually linear. The Newton-Raphson, Bairstow and other useful processes are ignored.

In general, the material is directed to the solution of ordinary differential equations with constant coefficients, with applications mostly to mechanical and electromechanical systems. For readers of this journal, the only useful feature of the book is a table of Laplace transform pairs [$F(s)$ is the Laplace transform of $f(t)$], where $F(s) = p(s)/q(s)$, $p(s)$ is at most a cubic in s, and $q(s)$ is most often a quartic in s, though there are some cases where $q(s)$ is a quintic or a sextic. The table comprises about 75 pages. In each case, $q(s)$ is represented in factored form as a product of linear and/or quadratic factors. A certain coding is used to facilitate location of $f(t)$ corresponding to a given $F(s)$.

Y. L. L.