mathematics, where new theoretical developments go hand in hand with important practical applications.

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75[X].—N. L. JOHNSON, *Tables to Facilitate Fitting S_U Frequency Curves*, New Statistical Tables Series No. 32, Biometrika Office, University College, London, University Printing House, Cambridge, England, 1965, 12 pp. Price 5s.

Let

$$z = \gamma + \delta \sinh^{-1} y$$

where y is a normal random variable with mean 0 and variance 1. The moments of z are involved functions of γ and δ. Tables with four significant figures for γ and δ are given in terms of the moment ratios $\sqrt{\beta_1}$ and β_2. The domain is $\sqrt{\beta_1} = 0.05(.05)2.00$ and β_2 from 3.2 to 15.0, first in steps of 0.1 and then in steps of 0.2.

Methods of interpolation, related tables, examples, and the method by which this table was constructed are presented.

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EDITORIAL NOTE: These tables appeared originally in *Biometrika*, v. 52, 1965, pp. 547–558.

76[X].—EUGENE ISAACSON & HERBERT BISHOP KELLER, *Analysis of Numerical Methods*, John Wiley and Sons, Inc., New York, 1966, xv + 541 pp., 24 cm. Price $11.95.

This book on numerical analysis has certain special features which should make it a welcome addition to the array of texts on this subject. Its position is somewhere in between a text for a stiff undergraduate course and a text for a moderate first graduate course. It contains a great deal of material, which is somewhat surprising since it is written in a style which avoids conciseness in presentation. This almost breezy approach to a mathematics text is, from my point of view, good because it gives a feeling of familiarity or of being comfortable with the ideas and techniques of the subject.

The book suffers from a complete absence of numerical examples, which must be supplied independently.

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77[X].—C. BALLESTER & V. PEREYRA, *Supplement to Bickley's Table for Numerical Differentiation*, ms. of 19 typewritten pages deposited in the UMT file and reproduced on the Microfiche page attached to this issue.

This unpublished table consists of the exact values of the integer coefficients ${}_{mn}A_{pr}$ and the coefficients to 5S (in floating-point form) of the error terms ${}_{mn}E_p$ for the discrete approximations

$$\frac{h^m}{m!} y^{(m)}(x_p) = \frac{1}{(n-1)!} \sum_{r=0}^{n-1} {}_{mn}A_{pr} y(x_r) + {}_{mn}E_p ,$$

where $x_r = x_0 + rh$, $p = 0(1)(n-1)$ for the ranges $m = 1(1)6$, $n = 7, 9$; $m = 5, 6$, $n = 8, 10$. The underlying calculations were performed on a CDC 3600 system.

An abridgement of Bickley's table [1] is given in the NBS *Handbook* [2]. The present authors have generated his entire table by the method of Gautschi [3] and thereby confirmed its accuracy.

The error term ${}_{mn}E_p$ can be expressed as ${}_{mn}e_p h^n y^{(n)}(\xi)$, where

$${}_{mn}e_p = -\frac{1}{n!(n-1)!} \sum_{j=0}^{n-1} (j-p)^n {}_{mn}A_{pj} .$$

For derivatives of even order the quantity ${}_{mn}e_{1/2(n-1)}$ vanishes, and the resulting symmetric formula is then accurate to an extra order of magnitude in h. Such error coefficients are identified in this supplementary table by an asterisk.

The authors include references to publications by Gregory [4] and Collatz [5]; however, they have not cited the relatively inaccessible tables of Kuntzmann [6], [7], which contain similar information for the first 10 derivatives.

J. W. W.

1. W. G. Bickley, "Formulae for numerical differentiation," *Math. Gaz.*, v. 25, 1941, pp. 19–27.

2. M. Abramowitz & I. A. Stegun, Editors, *Handbook of Mathematical Functions with Formulas, Graphs, and Mathematical Tables*, Dover, New York, 1965, p. 914. (See *Math. Comp.*, v. 20, 1966, p. 167, RMT **1**.)

3. W. Gautschi, "On inverses of Vandermonde and confluent Vandermonde matrices," *Numer. Math.*, v. 4, 1962, pp. 117–123.

4. R. T. Gregory, "A method for deriving numerical differentiation formulas," *Amer. Math. Monthly*, v. 64, 1957, pp. 79–82.

5. L. Collatz, *The Numerical Treatment of Differential Equations*, 3rd ed., Springer, Berlin, 1959.

6. J. Kuntzmann, *Formules de Dérivation Approchée au Moyen de Points Équidistants*, Report No. 1.373/1, Société d'Électronique et d'Automatisme, Courbevoie (Seine), France, 1954. (See *MTAC*, v. 10, 1956, pp. 171–172, RMT **51**.)

7. J. Kuntzmann, *Evaluations d'Erreur dans les Représentations Approchées de Derivées*, Société d'Électronique et d'Automatisme, Courbevoie (Seine), France, 1955. (See *MTAC*, v. 12, 1958, pp. 104–105, RMT **56**.)

78[X, Z].—Edmund C. Berkeley & Daniel G. Bobrow, Editors, *The Programming Language LISP: Its Operation and Applications*, The M.I.T. Press, Cambridge, Mass., 1966 (second printing), ix + 382 pp., 20 cm. Price $5.00.

This is a reprint of a collection of articles prepared several years ago by Information International for the Department of Defense. It was formerly available from the Department of Defense Documentation Center.

The LISP programming language was devised by John McCarthy in 1960 for symbol manipulation. It is based on function composition and evaluation according to Church's notion of lambda-conversion. Its data structures are in the form of lists of elements, with each element, which itself can be either an atom or a list, containing a pointer linking it to its successor. An ingenious scheme for automatic collec-