

7. M. E. Schonbek, Some Results on the Fitzhugh-Nagumo Equation.

The articles of a more applied nature, including the numerical aspects of diffusion theory are:

1. J. R. Cannon and R. E. Ewing, Galerkin Procedures for Systems of Parabolic Partial Differential Equations Related to the Transmission of Nerve Impulses.
2. J. W. Evans, Transition Behavior at the Slow and Fast Impulses.
3. N. J. Kopell, Waves, Shocks, and Target Patterns in an Oscillating Chemical Reagent.
4. J. Rinzel, Repetitive Nerve Impulse Propagation: Numerical Results and Methods.
5. A. D. Snider and D. L. Akins, Calculations of Transients for some Nonlinear Diffusion Phenomena.

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24 [7.30].—RALPH HELLER, *25D Table of the First One Hundred Values of $j_{0,s}$, $J_1(j_{0,s})$, $j_{1,s}$, $J_0(j_{1,s}) = J_0(j'_{0,s+1})$, $j'_{1,s}$, $J_1(j'_{1,s})$* , Department of Physics, Worcester Polytechnic Institute, Worcester, Massachusetts, 1976. Ms. of six pages deposited in the UMT file.

This is an attractively arranged, definitive table of the first 100 zeros of the Bessel functions $J_0(x)$, $J_1(x)$ and of their first derivatives, $J'_0(x)$ and $J'_1(x)$, together with the associated turning values of $J_0(x)$ and $J_1(x)$ and the values of $J_1(j_{0,s})$, all to 25 decimal places.

It supersedes, particularly in precision, all previous related tables, such as those of Meissel (as reproduced in Gray, Mathews and MacRobert [1]), the British Association for the Advancement of Science [2], and Gerber [3].

J. W. W.

1. A. GRAY, G. B. MATHEWS & T. M. MACROBERT, *A Treatise on Bessel Functions*, 2nd ed., Macmillan, London, 1922.

2. BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, *Mathematical Tables*, v. 6: *Bessel Functions, Part I*, Cambridge University Press, Cambridge, 1950.

3. H. GERBER, "First one hundred zeros of $J_0(x)$ accurate to 19 significant figures," *Math. Comp.*, v. 18, 1964, pp. 319–322.

25 [10].—JACOB T. B. BEARD, JR. & KAREN I. WEST, *Factorization Tables for Binomials over $GF(q)$* , The University of Texas at Arlington, Arlington, Texas and Mobil Research & Development Corporation, Dallas, Texas, ms. of 42 pp. $8\frac{1}{2}'' \times 14'' + 7$ pp. $8\frac{1}{2}'' \times 11''$, deposited in the UMT file.

The thirteen tables herein give the complete factorization over the Galois field $GF(q)$ of each monic binomial $B(x)$ of degree n , $2 \leq n \leq d$ as below, such that $x \nmid B(x)$, together with the generalized Euler Φ -function whenever $B(x)$ is not prime and $\Phi[B(x)] < 10^8$. Furthermore, the numerical exponent and the q -polynomial are given for each $B(x)$ whenever $2 \leq n \leq d_1$. The numerical exponent assigned to a nonprime

binomial in these tables is the multiplicative order of the companion matrix of $B(x)$.

The tables correspond, respectively, to the following sets of values of q , d , and d_1 :

$$\begin{array}{ll} q = 2^2, d = 16, d_1 = 15 & q = 5, d = 21, d_1 = 11 \\ q = 2^3, d = 8 & q = 5^2, d = 10 \\ q = 2^4, d = 6 & q = 7, d = 10 = d_1 \\ q = 2^5, d = 4 & q = 11, d = 10, d_1 = 8 \\ q = 3, d = 26, d_1 = 15 & q = 13, d = 10 \\ q = 3^2, d = 9 & q = 17, d = 10 \\ & q = 19, d = 10. \end{array}$$

The representation for $\text{GF}(p^\alpha)$, $\alpha \geq 1$, is that discussed in [1] and used previously in [2], [3], and [4]. In the introduction to the present tables the authors prove that a prime binomial of degree $n \geq 2$ is not primitive of the first, second, or third kind [1].

J. W. W.

1. J. T. B. BEARD, JR., "Computing in $\text{GF}(q)$," *Math. Comp.*, v. 28, 1974, pp. 1159–1166.
2. J. T. B. BEARD, JR. & K. I. WEST, "Some primitive polynomials of the third kind," *Math. Comp.*, v. 28, 1974, pp. 1166–1167.
3. J. T. B. BEARD, JR. & K. I. WEST, "Factorization tables for $x^n - 1$ over $\text{GF}(q)$," *Math. Comp.*, v. 28, 1974, pp. 1167–1168.
4. J. T. B. BEARD, JR. & K. I. WEST, "Factorization tables for trinomials over $\text{GF}(q)$," *Math. Comp.*, v. 30, 1976, pp. 179–183.

26 [2.05, 2.10, 3.00, 4.00, 5.00, 6.15].—D. A. H. JACOBS, Editor, *The State of the Art in Numerical Analysis*, Academic Press, London, 1977, xix + 978 pp., 23 cm. Price \$39.00.

This volume is based on material presented at a conference held at the University of York in the spring of 1976. The topics surveyed are: linear algebra, error analysis, optimization and non-linear systems, ordinary differential equations and quadrature, approximation theory, parabolic and hyperbolic problems, elliptic problems, and integral equations. In all there are twenty-three authors each contributing a section of one of the above-mentioned chapters.

J. B.

27 [2.00].—J. DESCLOUX & J. MARTI, Editors, *Numerical Analysis*, Proceedings of the Colloquium on Numerical Analysis, International Series of Numerical Mathematics, Birkhäuser Verlag, Basel, Switzerland, 1977, 248 pp., 24 cm. Price approximately \$22.00.

This volume contains papers presented at a meeting organized by the editors. This meeting took place at Lausanne, Switzerland, October 11–13, 1976.

J. B.

28 [10.35].—DAN ZWILLINGER, *Magic Labellings*, Massachusetts Institute of Technology, Cambridge, Massachusetts, 1977, iii + 81 pages of computer output filed in stiff covers and deposited in the UMT file.