schemes, including the Romberg scheme, Newton-Cotes and Gaussian quadrature, and other miscellaneous integration formulas.

Chapter I (127 pages), concerned with the approximation of functions, is again in two parts. Part I, by G. Aumann, outlines the mathematical foundations of approximation theory. Part II, by R. Bulirsch and J. Stoer, addresses itself to the effective computation of functions on digital computers. Among the topics treated are Chebyshev expansion, the use of continued fractions, computation of elliptic functions by Bartky's transformation. Fourier analysis, including the Cooley-Tukey algorithm, and the recursive computation of cylinder functions. A number of ALGOL procedures are included.

Chapter J (51 pages), by H. P. Künzi, treats linear and nonlinear optimization problems. There is a brief outline of the mathematical theory of linear optimization, which is followed by a description of constructive solution algorithms, including Dantzig's simplex method, Gomory's integer programming algorithm, and the author's duoplex algorithm. On nonlinear problems one finds the Kuhn-Tucker theorem for convex problems, and Beale's algorithm for quadratic problems.

The final Chapter K (19 pages), by K. Samelson, starts with an intuitive introduction to the concepts of model, algorithm, and program, and continues to survey the organization of stored program digital computers and problem-oriented programming languages.

The aims set by the editors have been admirably achieved in this volume, and one anxiously looks forward to the appearance of the remaining two volumes.

W. G.

21[2.05].—C. T. FIKE, *Computer Evaluation of Mathematical Functions*, Prentice-Hall, Inc., Englewood Cliffs, N. J., 1968, xii + 227 pp., 24 cm. Price $10.50

The title of this volume is somewhat misleading inasmuch as the mathematical functions considered are largely elementary functions, and then only with real arguments. Accordingly, the methods of evaluation are those of polynomial and rational approximation (plus Newton's iteration in the case of the square- and cube-root). Within these restrictions, however, the author has given us an account which is eminently readable, sound in mathematical and computational detail, and rich in illustrative examples and cogent remarks. The treatment is thoroughly up-to-date and well documented by references, not only to the research literature, but also to manufacturer-supplied program libraries. The text can be highly recommended for reference use and for supplementary reading in a numerical analysis course at the junior-senior level.

The territory covered is well delineated by the chapter headings: 1. Error in Function Evaluation Computations; 2. Square-Root and Cube-Root Evaluation; 3. Reducing the Argument Range; 4. Polynomial Evaluation Methods; 5. Minimax Polynomial Approximations; 6. Chebyshev Polynomials and Chebyshev Series; 7. Various Polynomial Approximation Methods; 8. Rational-Function Evaluation Methods; 9. Minimax Rational Approximations; 10. Various Rational Approximation Methods; 11. Asymptotic Expansions. Each chapter is followed by a bibliography and a set of exercises.

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