16[H].—CHIH-BING LING, *Values of the Roots of Eight Equations of Algebraic-Transcendental Type*, Virginia Polytechnic Institute, Blacksburg, Virginia, June 1965, ms of 11 typewritten sheets deposited in UMT File.

Professor Ling considers the eight equations $\sinh z \pm z = 0$, $\sin z \pm z = 0$, $\cosh z \pm z = 0$, and $\cos z \pm z = 0$, giving a detailed historical account of their solution as well as the mathematical procedure used in preparing his tables.

The real and imaginary parts of the first 100 roots appearing in the first quadrant of the complex plane are tabulated to 11D, based on computations performed on an IBM 1401 computer. Rules for deducing the corresponding roots in the remaining quadrants are also given. The single real root of the equation $\cos z - z = 0$ appears to higher precision (20D) in the text.

A valuable feature of this manuscript report is the bibliography of 16 titles covering earlier calculations and applications of such tables.

J. W. W.

17[H, X].—B. E. MARGULIS, *Systems of Linear Equations*, translated and adapted from the Russian by Jerome Kristian and Daniel A. Levine, Pergamon Press, New York, 1965, ix + 88 pp., 22 cm. Price $2.75.

This is a quite literate treatment at the high-school level, that includes elimination, determinants, successive approximation, least squares, and graphical solution, in that order. One is pained to see parentheses missing on page 1 from polynomials to be divided, but elsewhere they seem to be present where needed.

A. S. H.

18[I, X].—PHILIP J. DAVIS, *Interpolation and Approximation*, Blaisdell Publishing Company, New York, 1963, xiv + 393 pp., 24 cm. Price $12.50.

This is an excellent textbook on approximation theory, emphasizing its intrinsic relations with other areas of analysis. For example, a student who pursues this text can learn from it the fundamentals of functional analysis "on the job" while studying approximation theory. The interplay between approximation theory, functional analysis, and numerical analysis is displayed in a highly attractive fashion.

The first chapter serves as an introduction, summarizing mathematical material to be used subsequently in the text.

This is followed by a chapter on (finite) interpolation, the treatment being carried out in a very general setting but including many concrete and important examples.

The third chapter, entitled "Remainder Theory," is concerned with formulas for the difference between a function and its Lagrange interpolation polynomials.

Chapter IV ("Convergence Theorems for Interpolatory Processes") centers about the problem of convergence of the Lagrange interpolation polynomials of a given function in the complex domain.

The following chapter, entitled "Some Problems of Infinite Interpolation," is concerned, too, with interpolation in the complex domain.

Chapter VI ("Uniform Approximation") begins with the Weierstrass approximation theorem. In this connection the author develops the theory of the Bernstein polynomials, following which he discusses the Hermite-Fejér polynomials, a theorem of J. L. Walsh on simultaneous approximation and interpolation by polynomials, and the Stone-Weierstrass theorem.

Chapter VII ("Best Approximation") deals with the existence, uniqueness, and other properties of best approximations. Its central topic is the Tschebyscheff best approximation (in the real and in the complex domains).

The next chapter, entitled "Least Square Approximation," is concerned with this classical subject, developed via the theory of inner product spaces.

Chapter IX is an introduction to the theory of Hilbert space, while Chapter X is concerned with the subject of orthogonal polynomials. Such polynomials are considered again in an appendix, entitled "Short Guide to the Orthogonal Polynomials," appearing at the end of the book.

The eleventh chapter is entitled "The Theory of Closure and Completeness"; it deals with pertinent topics from both classical and functional analysis. Included are classical results of Runge and Walsh on approximation in the complex domain and the Müntz closure theorems.

In the next chapter ("Expansion Theorems for Orthogonal Functions") we find a study of Fourier series, convergence of the Legendre series for analytic functions, complex orthogonal expansions, and reproducing kernel functions.

Chapter XIII ("Degree of Approximation") deals with measures of best approximation for different norms. Various estimates of such measures are given.

The concluding chapter, entitled "Approximation of Linear Functionals," contains such topics as the Gauss-Jacobi theory of approximate integration, weak* convergence and its applications, and equidistributed sequences of points.

A bibliography, listing 141 books and papers, is appended.

One of the attractice features of the book is the inclusion of a large number of illustrative examples and problems.

One is impressed by the success of the author in attractively presenting many chapters of classical and functional analysis via approximation theory. The author imparts to the reader his own enthusiasm and appreciation for the beauty of mathematical analysis as well as for its practical applications.

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19[K].—V. D. Barnett, *Random Negative Exponential Deviates*, Cambridge University Press, New York, 1965, xxii + 89 pp., 23 cm. Price 10s 6d (paperbound).

This tract presents three tables. The first is a table of 10,000 four-place pseudorandom numbers x belonging to the probability density exp $(-x)$. These numbers were generated in the form $x = -\ln y$, where the numbers y were generated by the congruential method for simulating uniformly distributed random variates on the interval $0 < y < 1$. The second table consists of the 10,000 numbers $x' = -\ln(1 - y)$. These numbers are negatively correlated with the corresponding numbers x. In Monte Carlo applications, corresponding pairs x, x' are used in the method of antithetic variates. The last table consists of 1,000 samples of a pseudo-