It will be observed that linear algebraic equations and matrix theory have been omitted " ··· because I feel that this topic is best dealt with in a separate course". It should also be observed that Part Three, on Computation, covers less than 10 % of the entire book.

The book is written in the author's usual clear, elegant style and achieves what he set out to do.

R. W. HAMMING

93[X].—GÜNTER MEINARDUS, *Approximation von Funktionen und ihre numerische Behandlung*, Springer-Verlag, Berlin, 1964, viii + 180 pp., 23 cm. Price DM 49.

This book is a well-organized introduction to approximation theory. The presentation begins with fundamentals and progresses to the frontiers of present knowledge in many areas. The book is rather short, but is organized so as to present a surprisingly large number of results. This is accomplished by the use of many "small type" sections where references to proofs, rather than proofs, are given. The level is about the same as the book of Achieser (i.e., roughly second-year graduate level). The computational problem for Tchebycheff approximation is considered in some detail and depth.

The book is divided into Part 1: Linear Approximation (124 pages) and Part 2: Nonlinear Approximation (47 pages). The chapter headings of Part 1 indicate its contents: 1. The General Linear Approximation Problem, 2. Closed Systems, 3. General Theory of Linear Tchebycheff Approximation, 4. Special Tchebycheff Approximation, 5. Degree of Convergence for Trigonometric and Polynomial Approximation, 6. Polynomial Approximation, 7. Numerical Methods for Linear Tchebycheff Approximation.

Part 2 consists of three chapters: 8. General Theory of Nonlinear Tchebycheff Approximation (primarily an exposition of recent results of Meinardus and Schwedt), 9. Rational Approximation (a combination of selected classical results—of de la Vallée Poussin and of Walsh—and recent results, including Werner's analysis of the Remes algorithm for rational approximation), 10. Exponential Approximation (an exposition of the recent results of Rice).

There is a well-selected bibliography of about 160 items. It is up to date, and includes both Russian and western literature.

In conclusion, this book is highly recommended as an introduction to modern approximation theory.

JOHN R. RICE

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94[X].—D. S. MITRINOVIĆ, *Elementary Inequalities*, P. Noordhoff Ltd., Groningen, The Netherlands, 1964, 159 pp., 22 cm. Price $5.75.

This is a short book devoted to various applications of the elementary inequalities, which is to say, those associated with the names of Cauchy-Schwarz, Hölder, Minkowski, Jensen, et al., and to the derivation of numerous special inequalities for the elementary functions of analysis. There is also a brief chapter on geometric inequalities.

It reads well, is attractively printed, and is highly recommended. It will be

particularly useful to analysts of all kinds who need an unconventional inequality at a critical juncture in a proof, to high school and college teachers who want interesting problems for their classes, and to students who wish to practice their analytic skills.

RICHARD BELLMAN

95[X].—JOHN R. RICE, *The Approximation of Functions*, Vol. 1: *Linear Theory*, Addison-Wesley Publishing Company, Inc., Reading, Mass., 1964, x + 203 pp., 24 cm. Price $8.75.

Most of the volume is concerned with the problem of best approximation of a given real function f by a linear combination of given real functions $\phi_1, \phi_2, \cdots, \phi_n$ over a closed interval or over a finite (real) point set. Special cases emphasized are the classical ones of best approximation by polynomials and by trigonometric polynomials, but the more general setting is stressed to a much larger degree than that common in other texts.

The first chapter (entitled Fundamentals) is an introduction to the subject, in which the author seeks to give the reader a feeling for approximation theory and its methods. Also some theorems relating to the foundation of the theory are proved in this chapter.

The second chapter is a brief introduction to the subject of orthogonal systems of functions. The author succeeds in clearly showing the advantages of least-squares approximation from the points of view of ease of computation and simplicity and elegance of theory.

The third chapter deals quite extensively with the theory of best Tchebycheff approximation.

Chapter 4 discusses the problem of best approximation in the L_1 norm.

Chapter 5 (The Weierstrass Theorem and Degree of Convergence) deals mainly with classical results of Weierstrass, Fejér and Jackson, namely, those theorems which (together with Tchebycheff's work) form the classical backbone of approximation theory in the real domain.

The sixth chapter (Computational Methods) gives a survey of methods for the actual construction of best (or merely good) approximations. Two of the methods discussed are the method of descent and linear programming.

The book is rich in problems (of which some serve as exercises and others as an integral part of the text) and in illustrations. It is suitable both as a reference and as a classroom text.

As to the material presented, the book combines classical results with recent ones, including contributions of the author to approximation theory.

It is a highly valuable work that should attract many to study the theory of approximation and to contribute to it.

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96[X].—JAMES SINGER, *Elements of Numerical Analysis*, Academic Press, Inc., New York, 1964, x + 395 pp., 24 cm. Price $8.75.