

54 [X].—R. ZURMÜHL, *Praktische Mathematik für Ingenieure und Physiker*, Springer Verlag, Berlin-Wilmersdorf, 1961, xv + 548 p., 24 cm. Price DM 29.40.

This book, the third edition of Zurmühl's *Praktische Mathematik*, is intended to introduce the reader to many of the numerical methods for the solution of those mathematical problems that are most frequently met by the engineer. A small part of the presentation is devoted to graphical procedures for the solution of problems, but the bulk of the book deals with computational methods. The tool of computation which the author has in mind is primarily the desk computer, sometimes the slide rule, and only occasionally the electronic high-speed computer.

The book assumes as prerequisite not much more than a familiarity with the contents of a good calculus course and with the elements of linear algebra and of differential equations. The computational methods presented are described in considerable detail, including a review of much of the underlying theory.

The main topics are methods of solution for equations in one unknown (especially algebraic equations), elimination and iteration procedures for systems of linear equations, the study of matrices and their eigenvalue problems, interpolation, and numerical as well as graphical integration. The chapter on statistics is greatly enlarged in the third edition. It is followed by a chapter on the presentation of arbitrary functions, which contains a section on Fourier Analysis. The last two chapters deal in considerable detail with ordinary differential equations, the first with initial-value problems, and the other with boundary-value and eigenvalue problems. Partial differential equations are considered to be outside the scope of the book.

The presentation does not claim to be comprehensive, nor is it intended to be a mere conglomeration of methods of solution for mathematical problems. While the book does not intend to prove all theorems used, it avoids the other extreme of merely enumerating results. The reader is not only presented with the details of the numerical solution of a problem, but he is also given a thorough introduction to the ideas that lead up to the method, and so he is forewarned against applying the method to cases where its validity has not been established. While the book assumes that the reader is primarily interested in the use of a desk calculator, the greater part of the book will serve well as an introduction to methods which are of great importance in the preparation of problems for an electronic high-speed digital computer.

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