The use of tables of numerical values for velocity and tangent problems in the first chapter provides an excellent basis for the later development of limits and derivatives. The scope of the book is traditional, with derivatives introduced on page 22, differentials on page 93, integrals on page 108, infinite series on page 316, approximate integrals on page 388, partial differentiation on page 396, multiple integrals on page 434, and differential equations on page 467. There is a table of 105 integrals. The appendix includes 22 infinite series for reference and about 70 curves with their equations. The book is self-contained with respect to tables. There are ample numerical exercises and problems; answers for most odd-numbered problems are included at the back of the book.

Some instructors will want to emphasize the concept of "range" when variables are first introduced, to consider some of the applications of the integral earlier, and to consider approximate integration earlier. Such modifications should not be difficult. Even if considered necessary, their inconvenience would be more than compensated for by the "Review and Discussion Questions" at the end of most chapters and the excellent exposition throughout the book.

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Mathematical Analysis. By Tom M. Apostol. Addison-Wesley, Reading, 1957. xii+553 pp. $9.00.

This book treats the topics which usually fall under the heading of "Advanced Calculus." It includes rigorous proofs of many of the theorems which are usually considered too difficult for an advanced calculus text, but too elementary for a course in function theory. In the author's words, "the book helps to fill the gap between elementary calculus and advanced courses in analysis. More important than this, it introduces the reader to some of the abstract thinking that pervades modern mathematics."

The first chapter, "The Real and Complex Number System," forms an excellent introduction. Elements of set theory are presented in the next two chapters. The remaining chapters include a discussion of limits and continuity, differentiation, applications of partial differentiation, functions of bounded variation, connectedness, the Riemann-Stieltjes integral, multiple and line integrals, vector analysis, infinite series and products, Fourier series and integrals, and an introduction to the theory of functions of a complex variable.

The appearance of the book is pleasing. Theorems and definitions are stated in italics. In addition to the usual index, the book contains an index of special symbols.

The exercises which appear at the end of each chapter are unusually well chosen; many of them will present a real challenge to the better students. Lists of references for further study conclude many of the chapters.

Because of the difficulties involved when many omissions are made from a

text, this book would seem most suitable for students who have had some introductory work in advanced calculus. For such classes it should prove to be excellent both as a text and as a reference book.

F. M. MEARS
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Theorie der Beugung Elektromagnetischer Wellen. By W. Franz. Springer, Berlin, 1957. iv+123 pp. DM 21.60.

If the title of this book led one to seek in it a comprehensive exposition of the theory of the diffraction of electromagnetic waves, one would be disappointed by its lack of completeness. But the book could hardly aim at completeness in view of its mere hundred-odd pages, and is more aptly described as a monograph than as a treatise. It takes for granted existence and uniqueness theorems, and is principally, though by no means wholly, concerned with presenting a detailed, self-contained account of the method of solution by means of the Watson transformation, especially as applied to the cylindrical case for which Professor Franz himself first gave the solution. The Watson transformation is a powerful device whereby certain series can be transformed into other series that converge far more rapidly. The author treats the subject with authority and insight, and in ample detail, giving careful discussions, for example, of the paths of integration of the complex integrals that yield the Watson transformations for the cylindrical and spherical cases, and explaining clearly the significance of the residue waves as the so-called creeping waves.

These items are contained in the central section of the book. They are preceded by a preliminary section dealing with such necessary matters as Green's functions and dyadics, and boundary conditions; and they are followed by a section dealing with diffraction by objects having edges. This final section treats an assortment of special topics, from the Sommerfeld wedge theory to the recent Braunbek method, and covers, with a few notable exceptions, the principal problems whose solutions are known.

The book is up-to-date both in method and outlook. Despite an evident pressure of space, Professor Franz has illuminated it with frequent interpretative insights. It will be warmly welcomed by people working in the field, and should be of more than passing interest to other mathematicians.

BANESH HOFFMANN
Queens College

Numerical Analysis. By Kaiser S. Kunz. McGraw-Hill, New York, 1957. xv+381 pp. $8.00.

This book, based on graduate lecture courses at the Harvard University Computation Laboratory, is designed to "acquaint the student with the best procedures available for obtaining numerical solutions to problems arising in applied mathematics," with special attention to differential and integral equa-