MADDOX, I. J., *Elements of Functional Analysis* (Cambridge University Press, 1970), x+208 pp., £2.50.

The purpose of this book is to provide a readable introductory course on functional analysis for undergraduates who have completed basic courses on real and complex analysis. The first chapter is introductory. The basic concepts of set and function are discussed, results on real and complex analysis are recalled, and some inequalities are proved. Chapter 2 is concerned with metric and topological spaces. The standard topological notions are developed in the metric space setting. Also there are sections on topological spaces, the contraction mapping principle and the Baire category theorem. In Chapter 3, topological linear and linear metric spaces are studied. There is a section on bases in vector spaces, and a brief introduction to the theory of distributions is given. Chapter 4 is concerned with normed vector spaces. The Hahn-Banach theorem, the open mapping and closed graph theorems, and the uniform boundedness principle are covered, and applications are given. Chapter 5 provides a brief introduction to the theory of Banach algebras. The Gelfand-Mazur theorem is obtained. Also a weak and not particularly useful version of the Gelfand representation theorem is proved. Chapter 6 contains a standard introduction to the geometry of Hilbert space. The final chapter is concerned with summability theory, the author's personal research interest. The theorems of Silverman, Toeplitz and Schur are proved, and various methods of summability of sequences by infinite matrices are discussed. The book concludes with 41 problems (solved and unsolved), mainly on the contents of the last chapter. Generally speaking, the book succeeds in its modest aims. There are numerous examples and a wide variety of exercises in the text. Also the printing is of the high standard we have come to expect from Cambridge University Press. However, there is very little new material in the first six chapters of the work. Also most of the examples in the text pertain to sequence spaces. This, together with the last chapter, might create the unfortunte impression that summability theory is one of the main areas of research in functional analysis. The reviewer is of the opinion that a chapter on the theory of linear operators on Hilbert space would have been more appropriate than Chapter 7, in an introductory text.

H. R. DOWSON

LEECH, JOHN (Editor), *Computational Problems in Abstract Algebra*, Proceedings of a Conference held at Oxford under the auspices of the Science Research Council Atlas Computer Laboratory (Pergamon Press, Oxford, 1970), £7.

The volume contains thirty-five articles by some of the world's leading experts on the use of computers in abstract algebra. The first paper, by J. Neuböser, on *Investigations of groups on computers*, gives a very readable survey of a wide variety of problems. Most of the subsequent papers are on more specialised problems and more than half the volume is taken up with group theory. The other branches of algebra represented include semigroup theory, Jordan algebras, Galois theory, knot theory and algebraic topology. Apart from the interest of the individual articles it is useful to have available in a single volume the most recent numerical results. This is a rapidly moving field and several improvements have been made and new results have been found since the conference was held; some of these have been incorporated or added in proof.

R. A. RANKIN

CRAMÉR, H., *Random Variables and Probability Distributions* (Third Edition, Cambridge University Press, 1970), vi+118 pp.

This classic Cambridge Tract is not quite as indispensable as it was for many years following the publication of the First Edition in 1937, since much of the ground

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