the completeness of the orthogonal trigonometric functions, and the eigenspace corresponding to multiple matrix eigenvalues.

Some parts of the subject matter, however, appear to be rather old-fashioned. This is particularly so in the chapter on ordinary differential equations, where some of the material could have been more profitably replaced by an introduction to phase plane methods and stability ; and in the chapter on matrices, where no mention is made of linear independence. Other, more minor criticisms, are the use of $\wedge$ for vector products, the use of " boundary conditions " to include initial conditions, and the omission of a description of characteristics for hyperbolic equations (on the grounds of difficulty).

The text and diagrams are very clearly printed, and fairly free of misprints—I only found ones on pp. 196, 476 and 489. On p. 259 there is an erroneous statement, which may be typographical in origin.

It should be noted by prospective purchasers that some knowledge of physics is helpful for some of the examples and exercises, and for the chapter on tensors. A point which should be observed, since this Journal is a Scottish publication, is that the preliminary knowledge assumed is that for the Advanced Level examination in Mathematics for Natural Science, the syllabus for which few Scottish school-leavers have studied. Consequently it may not be possible for this book to fit into the curricula at Scottish universities. Should its material mirror the content of any particular course, I feel it would be a helpful text for the students involved.

D. W. ARTHUR

SEGAL, G. (Editor), *New developments in Topology* (London Mathematical Society Lecture Note Series 11, Cambridge University Press, 1974), 128 pp., £2·60.

The Proceedings of the Symposium on Algebraic Topology held in Oxford in June 1972 have been revised and collected for publication as this book. Not every speaker at the conference has contributed a paper but the main themes are well covered.

Infinite loop spaces and their relation to generalised cohomology theories are studied from varied points of view. Solutions to the problems of detecting and approximating infinite loop spaces are given here by May for the non-connected case. By studying certain maps between the infinite loop spaces of projective space and the O-sphere, Segal obtains results on operations in stable homotopy theory. Hodgkin looks at Dyer-Lashof operations in K-theory with a view to axiomatising operations in a generalised homology theory.

K-theory appears again in the paper by Adams in which it is shown that no new information can be gained by using tertiary or higher order K-theory operations. The second part of this paper indicates some unsolved problems about projective spaces. Brown and Comenetz set up Pontryagin duality between the generalised homology and cohomology theories which arise from a spectrum.

The emphasis of the book is on algebra, with very little mention of the underlying geometry. In one of the more geometrical papers Zabrodsky characterises, up to mod p homotopy equivalence, H-spaces X for which $H^*(X ; \mathbf{Z}p)$ is an exterior algebra on two generators. Maps between the classifying spaces of Lie groups are studied by Hubbuck while Madsen and Milgram fill in some more detail about the classifying spaces B_{PL}, B_{TOP} and B_G and the relations between them.

The remaining three papers are concerned with algebraic K-theory. Dold considers the function induced in K-theory by a functor F between two categories of finitely generated projective modules in the case where F is non-additive but of finite degree. Wall obtains results in equivariant K-theory and Quillen outlines a higher K-theory, defined on a category with exact sequences, in which there is a long exact K-sequence.

This is a useful collection of papers and a clear indicator of the areas of topology at present attracting most interest.

S. CORMACK

PACKEL, E. W., *Functional analysis, A short course* (International Textbook Co., 1974), xvii + 172 pp., £4·50.

This book covers the standard introductory topics of functional analysis, and the chapter headings provide a general outline : Topological linear spaces, Locally convex spaces, Banach space, Integration and measure theory, Hilbert space, Commutative Banach algebras and a spectral theorem. The spectral theorem referred to is that a normal operator and its adjoint generate a unital Banach algebra isometrically isomorphic to the algebra of continuous functions on the spectrum of the operator. The book has sufficient detail and examples to be suitable as a text for students who have a good background in linear algebra and point set topology. The background required is carefully stated in a preliminary chapter. There are a couple of results that are assumed to be known, for example, the Stone-Weierstrass theorem, that if proved in the book would have made the book more accessible to students, with only a slight increase in length. The book progresses from the general to the specific. Those who like this approach and have the necessary background will find it a good textbook.

A. M. SINCLAIR

FOWLER, D. H., *Introducing Real Analysis* (Transworld Student Library, 1974), 127 pp., 80p.

This excellent little book is an introduction to elementary real analysis up to the Heine-Borel and Taylor's Theorems in one real variable. The author assumes that the graphical representation of a real valued function and the derivatives of some elementary functions are known. The algebraic and order properties of the rational and real numbers are discussed, and the upper bound property is defined for the reals. Continuity is developed in terms of neighbourhoods, and standard elementary results on continuity and differentiability are carefully proved. It is not suitable as the sole analysis text for a student continuing with mathematics but could assist students understanding the basic ideas in the less compromising books and lecture courses on real analysis.

A. M. SINCLAIR

https://doi.org/10.1017/S0013091500015650 Published online by Cambridge University Press