

An Introduction to Matrices, Sets and Groups, by G. Stephenson.
Longmans, London, 1965. xi + 164 pages. \$4.80.

The main body of this text written for science and engineering students deals with matrices. Although numerous text-books on matrix theory appeared in the last few years, this small book appears to be a useful addition to the library of the undergraduate. It gives a natural approach to the main topic, via sets and mappings, it treats the theory efficiently with emphasis on applications and useful techniques and it includes a short survey of group theory. It is presented in an easily readable manner, with the formal treatment preceded by intuitive introduction to the concepts and theorems and the text is supplemented with plenty of worked examples and practice problems, ranging from routine exercises to harder, more interesting problems to complete the theory. No mathematical knowledge beyond elementary algebra (including some familiarity with determinants), complex numbers and elementary calculus is assumed on the part of the reader and an extensive list of references is given for further studies.

In the introductory chapter on sets and mappings some fundamental laws of matrix-algebra are anticipated in the more general terms of operator algebra. The chapter is completed with a short survey of set algebra: the concepts are introduced in clear and simple terms and with the use of Venn diagrams the operation rules are established. Boolean algebra gets a passing mention in terms of a switching circuit example. The connection between Boolean and set algebra could have been brought out more clearly, with small sacrifice of space and simplicity.

Chapters 2 to 7 are given to matrix theory. The following topics are discussed in more or less detail: the basic laws of matrix algebra; symmetric, skew-symmetric, hermitian, skew hermitian, orthogonal and unitary matrices; partitioning; inverses and their practical evaluation, systems of linear equations (with square matrix); eigen-values and eigen-vectors; diagonalisation, functions of matrices, (i.e. Cayley Hamilton theorem, polynomials and series.)

The text is concluded with a rather attractive chapter on group theory, easily readable, with a clear and economical treatment of the concepts and examples of more interesting groups with their multiplication tables. Topics treated or touched are: symmetric groups, sub-groups, co-sets, representation. It is a good introduction to the text-books listed.

There are a number of misprints (e.g. missing equality sign on page 54, faulty suffix on the opposite page), faulty answers to practice-problems (e.g. problem 1(4), 2(4)), and a few loose or misleading statements.

The reviewer could not agree with the argument the author brings forth on page 10, when discussing the possibility of inverting the matrix transformation $Y = AX$ where A is a $m \times n$ matrix.

These minor faults and inaccuracies (and a few more) can easily be cleared up in a second edition.

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Proceedings of the Conference on Complex Analysis, Minneapolis, 1964. Edited by A. Aeppli, E. Calabi and H. Rohrl. Springer-Verlag, Berlin, Heidelberg, New York, 1965. Price DM. 38.-

This book is a collection of twenty-six papers presented to a conference held at the University of Minnesota from the 16th to the 21st of March, 1964. The authors of the papers and their titles are listed below. Reviews of the individual articles can be found in Mathematical Reviews.

K. Stein, "On Factorization of Holomorphic Mappings."

L. Bungart, "Cauchy Integral Formulas and Boundary Kernel Functions in Several Complex Variables."

W. F. Pohl, "Extrinsic Complex Projective Geometry."

S. Bergman, "Some Properties of Pseudo-conformal Images of Circular Domains in the Theory of Two Complex Variables."

I. Satake, "Holomorphic Imbeddings of Symmetric Domains into a Siegel Space."

A. Aeppli, "On Determining Sets in a Stein Manifold."

A. Aeppli, "On the Cohomology Structure of Stein Manifolds."

W. Stoll, "Normal Families of Non-negative Divisors."

J. J. Kohn, "Boundaries of Complex Manifolds."

H. Holmann, "Local Properties of Holomorphic Mappings."

L. Bers, "Automorphic Forms and General Teichmüller Spaces."

Ph. A. Griffiths, "The Extension Problem for Compact Submanifolds of Complex Manifolds I (the Case of a Trivial Normal Bundle)."

M. Kuranishi, "New Proof for the Existence of Locally Complete Families of Complex Structures."

N. Kuhlmann, "Algebraic Function Fields on Complex Analytic Spaces."

H. L. Royden, "Riemann Surfaces with the Absolute AB-maximum Principle."

A. Andreotti and E. Vesentini, "A Remark on Non-compact Quotients of Bounded Symmetric Domains."

H. J. Bremermann, "Pseudo-convex Domains in Linear Topological Spaces."