Matrices and Transformations, by Anthony J. Pettofrezzo. Prentice Hall, 1966. x + 133 pages. $3.95.

This book is intended primarily as a text for a one semester course for teachers in the elements of matrix theory, or, for use with an in-service institute, though it may also be useful with advanced high school students. With very few exceptions, attention is restricted to 2×2 and 3×3 matrices with real entries. Geometric interpretations and applications are emphasized throughout. In general, new topics are presented with painstaking care and with an abundance of well-chosen numerical examples. Rings and isomorphisms of rings are mentioned very briefly early in the book and are not used again. Because of the relaxed pace and the number of examples and exercises (together with answers to the odd-numbered problems) this book might be particularly suitable for independent reading.

Martin Pearl, University of Maryland

Linear Transformations and Matrices, by F.A. Ficken. Prentice Hall, Inc., 1967. xiii + 398 pages. $10.50.

This is a fairly large book and contains considerably more than the title promises. In addition to sufficient material for a one semester course in linear algebra, the first four chapters (consisting of 118 pages and comprising about one third of the text) present much of the material often found in a fundamentals course which usually precedes the calculus sequence. For this reason, and because the difficulties are introduced very gradually, it is possible to use this book for a one year course for students who have not had (and perhaps will never have) any calculus. In Chapter 1, the language of set theory and functions is presented. Chapter 2 is devoted to a development of the real number system. The vector geometry of three dimensional Euclidean space is treated in Chapter 3 and serves to prepare the student for the more general n dimensional geometry of later chapters. In addition, there are topics (e.g., the cross product of vectors) which are applicable primarily to three-dimensional spaces. Chapter 4 gives the barest essentials of groups, rings and fields. Permutations and polynomials are introduced, primarily because they will be needed later, as are partially ordered sets and lattices. Equivalence relations and the partitions they determine, are mentioned and are used later in describing canonical forms.

The remaining two thirds of the book is given over to a conventional (according to the author) basis - free presentation of real and complex finite dimensional vector spaces. Matrices are not emphasized and the determinant first appears in Chapter 11. Geometry is used throughout whenever possible and often provides insight into what would otherwise be tough sledding (e.g., projections).

A number of unusual topics are covered - most of them too briefly. These include: the pseudo-inverse of a matrix, the general form of the Laplace expansion (rather than just expansions by a single row or column),