Matrices are introduced in Chapter 1 as devices which convey all the necessary information on systems of linear equations. Their algebra is then developed. The second chapter is devoted to a treatment of linear equations. Chapter 3 deals with vector spaces. A formal definition of a vector space is given at the outset, affording the authors an opportunity to show how versatile vectors are. The usual topics: subspaces, linear independence, bases, row spaces, rank and canonical forms are developed, but with lots of examples of column vectors to keep the students' feet on the ground. In Chapter 4, determinants are introduced axiomatically, but quickly developed as signed sums of products. Chapters 5 and 6 treat linear transformations, and eigenvalues and eigenvectors, respectively. The authors switch back and forth easily between the matrix and the linear transformation points of view, using whichever approach seems more appropriate at any given time. The Jordan canonical form is given but not proved. There are a few pages on Markov Chains. Chapter 7, entitled Inner Product Spaces, includes the Gram-Schmidt orthonormalization process, unitary equivalence, and Hermitian, unitary and normal matrices. Applications to differential equations are given in Chapter 8.

While this book is aimed at students not primarily interested in mathematics, it would appear to be equally suitable for mathematics students.

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Linear Algebra. By Robert R. Stoll and Edward T. Wong. Academic Press, New York and London (1968). x+326 pp. U.S. $8.50.

This book is a welcome addition to the literature on linear algebra. The book is divided into nine chapters and an appendix which is devoted to notion of elementary set theory. The first eight chapters cover all the important topics, which usually constitute an introductory course on linear algebra. In Chapter 2, there is a brief excursion into the discussion of manifolds. The introduction of each concept is well motivated and the theorems are clearly stated and rigorously proved, using the basis-free methods as far as possible. Each section is followed by a number of solved examples, which illustrate the theorems. An excellent feature of the book is the discussion of calculation methods, and a large number of worked-out examples of computational nature, which, quoting the authors, enables the students not only to cope with the theoretical problems, but also help the students to grapple with "dirty" computational problems as well. There are over 300 well graded exercises, with hints to more difficult ones. The ninth chapter deals with a good but brief application of linear algebra to other fields. There are no formal prerequisites, though a knowledge of calculus and linear differential equations is required for understanding and solving some of the examples and exercises.

There are however a few inadequacies. The reviewer would have preferred an early introduction of matrices. The book deals with them formally in Chapter 5, though they are used a number of times in the preceding chapters. Besides there is a large number of misprints and a few minor errors. In spite of this, I think the book will prove very satisfactory as a textbook at an advanced undergraduate level.

The chapters are: 1. Vector Spaces; 2. Further Properties of Vector Spaces; 3. Inner-Product Spaces; 4. Linear Transformations; 5. Matrices; 6. Algebraic Properties of Linear Transformations; 7. Bilinear Forms and Quadratic Forms; 8. Decomposition Theorems for Normal Transformations; 9. Several Applications of Linear Algebra.

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Theory of Matrices. BY PETER LANCASTER. Academic Press, New York and London (1969). 316 pp. U.S. $11.

This book is first of all a textbook for students of applied mathematics, engineering or science, but not only that. It presents also the most important, as well as some most recent results, in matrix theory, especially in the author's field of interest, i.e. perturbation theory and the theory of small vibrations.

Let us sketch the contents. The book has nine chapters and three appendices. Chapter 1 is the introductory one and contains the basic material about linear spaces, matrices and determinants. In Chapter 2, eigenvalues and eigenvectors of matrices are studied and properties of symmetric, hermitian, unitary and normal matrices are derived. Quadratic forms and definite matrices are discussed and used to the theory of small vibrations. Chapter 3 has the title Variational Methods and deals with the Rayleigh quotient and Courant-Fischer principle. In Chapter 4, the theory of lambda matrices is developed and used to the problem of normal forms of matrices under similarity transformations.

Chapter 5 contains the theory of functions of matrices. The author also use some notions of analysis to show the connections and adds some applications to the solution of differential equations. In Chapter 6, the theory of vector and matrix norms is developed. Chapter 7 is an introduction to the perturbation theory and contains also the most simple theorems on bounds of eigenvalues. Chapter 8 deals with three topics: direct products, solution of matrix equations and stability problems. In the last Chapter, the theory of nonnegative matrices and stochastic matrices is discussed and used to Markov chains. In the appendices, some theorems