

linear algebra hoffman

Diving Deep into Linear Algebra with Hoffman: A Comprehensive Guide

Introduction:

Are you grappling with the complexities of linear algebra? Feeling overwhelmed by the sheer volume of information and struggling to find a resource that truly clarifies the concepts? Then you've come to the right place. This in-depth guide focuses on Linear Algebra by Kenneth Hoffman and Ray Kunze – a classic text renowned for its rigor and clarity. We'll delve into the book's structure, its strengths and weaknesses, and offer practical advice for navigating its challenging yet rewarding content. Whether you're a student tackling linear algebra for the first time, or a seasoned mathematician looking for a refresher, this post will provide invaluable insights and help you master this crucial mathematical subject. We'll cover key chapters, common student hurdles, and provide tips and tricks to maximize your learning experience.

Understanding the Structure of Hoffman and Kunze's Linear Algebra

Hoffman and Kunze's Linear Algebra isn't just another textbook; it's a comprehensive exploration of the subject, known for its mathematically precise approach. Its structure, while rigorous, can be navigated effectively with the right strategy. Understanding this structure is key to successfully mastering the material.

Chapter-by-Chapter Breakdown:

The book's strength lies in its systematic progression through core linear algebra concepts. While the exact chapter titles might vary slightly across editions, the general flow remains consistent. Here's a broad overview:

Vector Spaces: This foundational chapter establishes the very concept of vector spaces, spanning sets, linear independence, and bases. It lays the groundwork for all subsequent chapters. Mastering this section is crucial for understanding the rest of the book.

Linear Transformations: Here, the focus shifts from static vectors to mappings between vector spaces. Concepts like null spaces, range spaces, rank, and nullity are introduced. This chapter is particularly important for understanding linear operators and their properties.

Matrices: This chapter connects the abstract concepts of vector spaces and linear transformations to the concrete world of matrices. Matrix operations, rank, invertibility, and elementary matrices are covered in detail. Understanding matrix representations is crucial for computational applications of linear algebra.

Determinants: This crucial chapter introduces the concept of determinants, their properties, and their role in solving systems of linear equations. The calculation and interpretation of determinants are key skills developed here.

Eigenvalues and Eigenvectors: This is arguably one of the most important chapters in the book, introducing eigenvalues and eigenvectors, which are fundamental to many applications, including differential equations and quantum mechanics. Understanding diagonalization and its implications is crucial.

Inner Product Spaces: This chapter extends the concepts of vector spaces to inner product spaces, introducing notions like orthogonality, orthonormal bases, and the Gram-Schmidt process. This is essential for understanding concepts in more advanced linear algebra and related fields.

Further Topics (depending on the edition): Later chapters often delve into more advanced topics, such as canonical forms, bilinear forms, and tensor products. These topics are often encountered in more specialized applications of linear algebra.

Navigating the Challenges: Tips for Success

Hoffman and Kunze's text is known for its rigorous mathematical precision. While this contributes to a deep understanding, it can also pose challenges for some students. Here are some tips to overcome these hurdles:

Active Reading: Don't just passively read the text. Work through each proof, theorem, and example. Try to understand the underlying logic and intuition behind each concept.

Problem Solving: The exercises are crucial. Attempt as many as possible, starting with the easier ones and gradually tackling the more challenging problems. Don't hesitate to seek help if you get stuck.

Seek Clarification: If a concept is unclear, don't hesitate to ask for help from a professor, teaching assistant, or fellow student. Discussion can often illuminate difficult concepts.

Utilize Supplementary Resources: While Hoffman and Kunze is a comprehensive text, supplementary resources such as online lectures, videos, or other textbooks can be beneficial.

Build a Strong Foundation: Ensure you have a strong understanding of prerequisite topics such as calculus and basic linear algebra before tackling this text.

Detailed Book Outline: Hoffman and Kunze's Linear Algebra

Title: Linear Algebra (2nd Edition) by Kenneth Hoffman and Ray Kunze

Contents:

Introduction: Sets the stage, introduces basic notation and terminology, and provides a brief overview of the subject matter.

Chapter 1: Vector Spaces: Defines vector spaces, subspaces, linear combinations, spanning sets, linear independence, bases, and dimension. Includes numerous examples and exercises to solidify

understanding.

Chapter 2: Linear Transformations: Introduces linear transformations, null spaces, range spaces, rank, nullity, isomorphism, and matrix representations of linear transformations.

Chapter 3: Matrices: Covers matrix operations, elementary matrices, invertibility, and the relationship between matrices and linear transformations.

Chapter 4: Determinants: Defines determinants, their properties, and their application in solving systems of linear equations. Covers various methods for computing determinants.

Chapter 5: Eigenvalues and Eigenvectors: Introduces eigenvalues, eigenvectors, characteristic polynomials, diagonalization, and their applications.

Chapter 6: Inner Product Spaces: Explores inner product spaces, orthogonality, orthonormal bases, Gram-Schmidt process, and orthogonal transformations.

Chapter 7: (Advanced Topics - Varies by Edition): This chapter might cover canonical forms, bilinear forms, tensor products, or other advanced topics depending on the edition.

Conclusion: Summarizes key concepts and provides a perspective on the broader context of linear algebra within mathematics.

Detailed Explanation of Outline Points:

Each chapter in the outline requires detailed explanation to fully grasp its content. Here's a deeper look into some key chapters:

Chapter 1: Vector Spaces: This chapter lays the foundation for the entire book. A thorough understanding of vector spaces, subspaces, basis, and dimension is crucial. Students often struggle with the abstract nature of vector spaces, so ample time and effort should be dedicated to this chapter. The concept of linear independence is particularly important and needs careful consideration.

Chapter 2: Linear Transformations: This chapter builds upon the foundation laid in Chapter 1. Linear transformations are introduced as functions between vector spaces that preserve linear combinations. Understanding the concepts of null space and range space is essential. This chapter also introduces the idea of representing linear transformations using matrices, which forms a crucial bridge to more computational aspects of linear algebra.

Chapter 5: Eigenvalues and Eigenvectors: This chapter is often considered the most challenging, yet also one of the most important, for its applications in various fields. Eigenvalues and eigenvectors are special scalars and vectors associated with a linear transformation that reveal crucial information about its properties. Understanding diagonalization is critical for simplifying computations and solving many types of problems.

Frequently Asked Questions (FAQs)

1. Is Hoffman and Kunze's Linear Algebra suitable for beginners? While rigorous, it's suitable for beginners with a strong math background. Supplement with other resources if needed.
1. What are the prerequisites for this book? A solid understanding of calculus and some prior exposure to linear algebra concepts is helpful.
1. Is there a solutions manual available? There are solutions manuals available, but working through problems independently is crucial for learning.
1. How does this book compare to other linear algebra textbooks? It's known for its rigor and theoretical depth, differing from more application-focused texts.
1. Is this book suitable for self-study? Yes, but it requires discipline and potentially supplemental resources.
1. What makes Hoffman and Kunze's book so popular? Its clear and concise presentation of fundamental concepts, rigorous proofs, and extensive exercises.
1. What are the most challenging sections in the book? Eigenvalues and eigenvectors, and the more abstract concepts in the later chapters.
1. Are there online resources to help with understanding the material? Yes, numerous online resources like videos, lectures, and discussion forums are available.
1. What are some real-world applications of the concepts covered in this book? Machine learning, computer graphics, quantum mechanics, cryptography, and many more.

Related Articles:

1. Linear Algebra: A Gentle Introduction: A beginner-friendly overview of basic linear algebra concepts.
1. Eigenvalues and Eigenvectors: A Practical Guide: Focuses specifically on eigenvalues and eigenvectors and their applications.
1. Matrix Operations and Their Applications: A detailed explanation of various matrix operations and their uses.
1. Understanding Vector Spaces: A Step-by-Step Approach: A comprehensive guide to understanding the concept of vector spaces.
1. Linear Transformations: A Visual Approach: Uses visuals to aid understanding of linear transformations.
1. Solving Systems of Linear Equations using Matrices: Covers techniques for solving systems of linear equations using matrices.
1. The Gram-Schmidt Process and its Applications: Explains the Gram-Schmidt process and its applications in finding orthonormal bases.
1. Introduction to Linear Algebra for Data Science: Focuses on the relevance of linear algebra in data science applications.
1. Linear Algebra in Machine Learning Algorithms: Explores the use of linear algebra in various machine learning algorithms.

linear algebra hoffman: Linear Algebra Done Right Sheldon Axler, 1997-07-18 This text for a second course in linear algebra, aimed at math majors and graduates, adopts a novel approach by banishing determinants to the end of the book and focusing on understanding the structure of linear operators on vector spaces. The author has taken unusual care to motivate concepts and to simplify proofs. For example, the book presents - without having defined determinants - a clean proof that every linear operator on a finite-dimensional complex vector space has an eigenvalue. The book starts by discussing vector spaces, linear independence, span, basics, and dimension. Students are introduced to inner-product spaces in the first half of the book and shortly thereafter to the finite-dimensional spectral theorem. A variety of interesting exercises in each chapter helps students understand and manipulate the objects of linear algebra. This second edition features new chapters on diagonal matrices, on linear functionals and adjoints, and on the spectral theorem; some sections, such as those on self-adjoint and normal operators, have been entirely rewritten; and hundreds of minor improvements have been made throughout the text.

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linear algebra hoffman: *Advanced Linear Algebra* Steven Roman, 2007-12-31 Covers a notably broad range of topics, including some topics not generally found in linear algebra books Contains a discussion of the basics of linear algebra

linear algebra hoffman: **Introduction to Linear Algebra** Serge Lang, 2012-12-06 This is a short text in linear algebra, intended for a one-term course. In the first chapter, Lang discusses the relation between the geometry and the algebra underlying the subject, and gives concrete examples of the notions which appear later in the book. He then starts with a discussion of linear equations, matrices and Gaussian elimination, and proceeds to discuss vector spaces, linear maps, scalar products, determinants, and eigenvalues. The book contains a large number of exercises, some of the routine computational type, while others are conceptual.

linear algebra hoffman: *LINEAR ALGEBRA* S. KUMARESAN, 2000-01-01 This clear, concise and highly readable text is designed for a first course in linear algebra and is intended for undergraduate courses in mathematics. It focusses throughout on geometric explanations to make the student perceive that linear algebra is nothing but analytic geometry of n dimensions. From the very start, linear algebra is presented as an extension of the theory of simultaneous linear equations and their geometric interpretation is shown to be a recurring theme of the subject. The integration of abstract algebraic concepts with the underlying geometric notions is one of the most distinguishing features of this book — designed to help students in the pursuit of multivariable calculus and differential geometry in subsequent courses. Explanations and concepts are logically presented in a conversational tone and well-constructed writing style so that students at a variety of levels can understand the material and acquire a solid foundation in the basic skills of linear algebra.

linear algebra hoffman: **Linear Algebra Problem Book** Paul R. Halmos, 1995-12-31 Linear Algebra Problem Book can be either the main course or the dessert for someone who needs linear algebra and today that means every user of mathematics. It can be used as the basis of either an official course or a program of private study. If used as a course, the book can stand by itself, or if so desired, it can be stirred in with a standard linear algebra course as the seasoning that provides the interest, the challenge, and the motivation that is needed by experienced scholars as much as by beginning students. The best way to learn is to do, and the purpose of this book is to get the reader to DO linear algebra. The approach is Socratic: first ask a question, then give a hint (if necessary), then, finally, for security and completeness, provide the detailed answer.

linear algebra hoffman: *Linear Algebra* Georgi? Evgen?evich Shilov, 1977-06-01 Covers determinants, linear spaces, systems of linear equations, linear functions of a vector argument,

coordinate transformations, the canonical form of the matrix of a linear operator, bilinear and quadratic forms, Euclidean spaces, unitary spaces, quadratic forms in Euclidean and unitary spaces, finite-dimensional space. Problems with hints and answers.

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linear algebra hoffman: Analysis in Euclidean Space Kenneth Hoffman, 2019-07-17 Developed for an introductory course in mathematical analysis at MIT, this text focuses on concepts, principles, and methods. Its introductions to real and complex analysis are closely formulated, and they constitute a natural introduction to complex function theory. Starting with an overview of the real number system, the text presents results for subsets and functions related to Euclidean space of n dimensions. It offers a rigorous review of the fundamentals of calculus, emphasizing power series expansions and introducing the theory of complex-analytic functions. Subsequent chapters cover sequences of functions, normed linear spaces, and the Lebesgue interval. They discuss most of the basic properties of integral and measure, including a brief look at orthogonal expansions. A chapter on differentiable mappings addresses implicit and inverse function theorems and the change of variable theorem. Exercises appear throughout the book, and extensive supplementary material includes a Bibliography, List of Symbols, Index, and an Appendix with background in elementary set theory.

linear algebra hoffman: Solutions Manual for Linear Algebra, Hoffman and Kunze Maurice Stadler, Gregory Grant, 2021-02-20 In addition to well-explained solutions, this manual includes corrections and clarifications to the classic textbook *Linear Algebra*, second edition, by Kenneth Hoffman and Ray Kunze. This manual is a great resource for checking answers, preparing for exams, and discovering new solution techniques as two or three solutions are provided for many exercises.

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linear algebra hoffman: Thirty-three Miniatures Jiří Matoušek, 2010 This volume contains a collection of clever mathematical applications of linear algebra, mainly in combinatorics, geometry, and algorithms. Each chapter covers a single main result with motivation and full proof in at most ten pages and can be read independently of all other chapters (with minor exceptions), assuming

only a modest background in linear algebra. The topics include a number of well-known mathematical gems, such as Hamming codes, the matrix-tree theorem, the Lovasz bound on the Shannon capacity, and a counterexample to Borsuk's conjecture, as well as other, perhaps less popular but similarly beautiful results, e.g., fast associativity testing, a lemma of Steinitz on ordering vectors, a monotonicity result for integer partitions, or a bound for set pairs via exterior products. The simpler results in the first part of the book provide ample material to liven up an undergraduate course of linear algebra. The more advanced parts can be used for a graduate course of linear-algebraic methods or for seminar presentations. Table of Contents: Fibonacci numbers, quickly; Fibonacci numbers, the formula; The clubs of Oddtown; Same-size intersections; Error-correcting codes; Odd distances; Are these distances Euclidean?; Packing complete bipartite graphs; Equiangular lines; Where is the triangle?; Checking matrix multiplication; Tiling a rectangle by squares; Three Petersens are not enough; Petersen, Hoffman-Singleton, and maybe 57; Only two distances; Covering a cube minus one vertex; Medium-size intersection is hard to avoid; On the difficulty of reducing the diameter; The end of the small coins; Walking in the yard; Counting spanning trees; In how many ways can a man tile a board?; More bricks--more walls?; Perfect matchings and determinants; Turning a ladder over a finite field; Counting compositions; Is it associative?; The secret agent and umbrella; Shannon capacity of the union: a tale of two fields; Equilateral sets; Cutting cheaply using eigenvectors; Rotating the cube; Set pairs and exterior products; Index. (STML/53)

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linear algebra hoffman: Basic Matrix Theory Leonard E. Fuller, 2017-09-13 This guide to using matrices as a mathematical tool offers a model for procedure rather than an exposition of theory. Detailed examples illustrate the focus on computational methods. 1962 edition.

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linear algebra hoffman: Mathematics for Machine Learning Marc Peter Deisenroth, A. Aldo Faisal, Cheng Soon Ong, 2020-04-23 The fundamental mathematical tools needed to understand machine learning include linear algebra, analytic geometry, matrix decompositions, vector calculus, optimization, probability and statistics. These topics are traditionally taught in disparate courses, making it hard for data science or computer science students, or professionals, to efficiently learn the mathematics. This self-contained textbook bridges the gap between mathematical and machine learning texts, introducing the mathematical concepts with a minimum of prerequisites. It uses these concepts to derive four central machine learning methods: linear

regression, principal component analysis, Gaussian mixture models and support vector machines. For students and others with a mathematical background, these derivations provide a starting point to machine learning texts. For those learning the mathematics for the first time, the methods help build intuition and practical experience with applying mathematical concepts. Every chapter includes worked examples and exercises to test understanding. Programming tutorials are offered on the book's web site.

linear algebra hoffman: Exercises And Problems In Linear Algebra John M Erdman, 2020-09-28 This book contains an extensive collection of exercises and problems that address relevant topics in linear algebra. Topics that the author finds missing or inadequately covered in most existing books are also included. The exercises will be both interesting and helpful to an average student. Some are fairly routine calculations, while others require serious thought. The format of the questions makes them suitable for teachers to use in quizzes and assigned homework. Some of the problems may provide excellent topics for presentation and discussions. Furthermore, answers are given for all odd-numbered exercises which will be extremely useful for self-directed learners. In each chapter, there is a short background section which includes important definitions and statements of theorems to provide context for the following exercises and problems.

linear algebra hoffman: A First Course in Calculus Serge Lang, 2012-09-17 This fifth edition of Lang's book covers all the topics traditionally taught in the first-year calculus sequence. Divided into five parts, each section of A FIRST COURSE IN CALCULUS contains examples and applications relating to the topic covered. In addition, the rear of the book contains detailed solutions to a large number of the exercises, allowing them to be used as worked-out examples -- one of the main improvements over previous editions.

linear algebra hoffman: Linear Algebra and Its Applications Peter D. Lax, 2013-05-20 This set features Linear Algebra and Its Applications, Second Edition (978-0-471-75156-4) Linear Algebra and Its Applications, Second Edition presents linear algebra as the theory and practice of linear spaces and linear maps with a unique focus on the analytical aspects as well as the numerous applications of the subject. In addition to thorough coverage of linear equations, matrices, vector spaces, game theory, and numerical analysis, the Second Edition features student-friendly additions that enhance the book's accessibility, including expanded topical coverage in the early chapters, additional exercises, and solutions to selected problems. Beginning chapters are devoted to the abstract structure of finite dimensional vector spaces, and subsequent chapters address convexity and the duality theorem as well as describe the basics of normed linear spaces and linear maps between normed spaces. Further updates and revisions have been included to reflect the most up-to-date coverage of the topic, including: The QR algorithm for finding the eigenvalues of a self-adjoint matrix The Householder algorithm for turning self-adjoint matrices into tridiagonal form The compactness of the unit ball as a criterion of finite dimensionality of a normed linear space Additionally, eight new appendices have been added and cover topics such as: the Fast Fourier Transform; the spectral radius theorem; the Lorentz group; the compactness criterion for finite dimensionality; the characterization of compact operators; proof of Liapunov's stability criterion; the construction of the Jordan Canonical form of matrices; and Carl Pearcy's elegant proof of Halmos' conjecture about the numerical range of matrices. Clear, concise, and superbly organized, Linear Algebra and Its Applications, Second Edition serves as an excellent text for advanced undergraduate- and graduate-level courses in linear algebra. Its comprehensive treatment of the subject also makes it an ideal reference or self-study for industry professionals. and Functional Analysis (978-0-471-55604-6) both by Peter D. Lax.

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algebra. The presentation emphasizes the structural elements over the computational - for example by connecting matrices to linear transformations from the outset - and prepares the student for further study of abstract mathematics. Uniquely among algebra texts at this level, it introduces group theory early in the discussion, as an example of the rigorous development of informal axiomatic systems.

linear algebra hoffman: Advanced Calculus (Revised Edition) Lynn Harold Loomis, Shlomo Zvi Sternberg, 2014-02-26 An authorised reissue of the long out of print classic textbook, Advanced Calculus by the late Dr Lynn Loomis and Dr Shlomo Sternberg both of Harvard University has been a revered but hard to find textbook for the advanced calculus course for decades. This book is based on an honors course in advanced calculus that the authors gave in the 1960's. The foundational material, presented in the unstarred sections of Chapters 1 through 11, was normally covered, but different applications of this basic material were stressed from year to year, and the book therefore contains more material than was covered in any one year. It can accordingly be used (with omissions) as a text for a year's course in advanced calculus, or as a text for a three-semester introduction to analysis. The prerequisites are a good grounding in the calculus of one variable from a mathematically rigorous point of view, together with some acquaintance with linear algebra. The reader should be familiar with limit and continuity type arguments and have a certain amount of mathematical sophistication. As possible introductory texts, we mention Differential and Integral Calculus by R Courant, Calculus by T Apostol, Calculus by M Spivak, and Pure Mathematics by G Hardy. The reader should also have some experience with partial derivatives. In overall plan the book divides roughly into a first half which develops the calculus (principally the differential calculus) in the setting of normed vector spaces, and a second half which deals with the calculus of differentiable manifolds.

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linear algebra hoffman: Linear Algebra and Geometry Igor R. Shafarevich, Alexey O. Remizov, 2012-08-23 This book on linear algebra and geometry is based on a course given by renowned academician I.R. Shafarevich at Moscow State University. The book begins with the theory of linear algebraic equations and the basic elements of matrix theory and continues with vector spaces, linear transformations, inner product spaces, and the theory of affine and projective spaces. The book also includes some subjects that are naturally related to linear algebra but are usually not covered in such courses: exterior algebras, non-Euclidean geometry, topological properties of projective spaces, theory of quadrics (in affine and projective spaces), decomposition of finite abelian groups, and finitely generated periodic modules (similar to Jordan normal forms of linear operators). Mathematical reasoning, theorems, and concepts are illustrated with numerous examples from various fields of mathematics, including differential equations and differential geometry, as well as from mechanics and physics.

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linear algebra hoffman: Linear Algebra Elizabeth S. Meckes, Mark W. Meckes, 2018-05-24

Linear Algebra offers a unified treatment of both matrix-oriented and theoretical approaches to the course, which will be useful for classes with a mix of mathematics, physics, engineering, and computer science students. Major topics include singular value decomposition, the spectral theorem, linear systems of equations, vector spaces, linear maps, matrices, eigenvalues and eigenvectors, linear independence, bases, coordinates, dimension, matrix factorizations, inner products, norms, and determinants.

linear algebra hoffman: *Linear Regression Models* John P. Hoffmann, 2021-09-12 Research in social and behavioral sciences has benefited from linear regression models (LRMs) for decades to identify and understand the associations among a set of explanatory variables and an outcome variable. *Linear Regression Models: Applications in R* provides you with a comprehensive treatment of these models and indispensable guidance about how to estimate them using the R software environment. After furnishing some background material, the author explains how to estimate simple and multiple LRMs in R, including how to interpret their coefficients and understand their assumptions. Several chapters thoroughly describe these assumptions and explain how to determine whether they are satisfied and how to modify the regression model if they are not. The book also includes chapters on specifying the correct model, adjusting for measurement error, understanding the effects of influential observations, and using the model with multilevel data. The concluding chapter presents an alternative model—logistic regression—designed for binary or two-category outcome variables. The book includes appendices that discuss data management and missing data and provides simulations in R to test model assumptions. *Features* Furnishes a thorough introduction and detailed information about the linear regression model, including how to understand and interpret its results, test assumptions, and adapt the model when assumptions are not satisfied. Uses numerous graphs in R to illustrate the model's results, assumptions, and other features. Does not assume a background in calculus or linear algebra, rather, an introductory statistics course and familiarity with elementary algebra are sufficient. Provides many examples using real-world datasets relevant to various academic disciplines. Fully integrates the R software environment in its numerous examples. The book is aimed primarily at advanced undergraduate and graduate students in social, behavioral, health sciences, and related disciplines, taking a first course in linear regression. It could also be used for self-study and would make an excellent reference for any researcher in these fields. The R code and detailed examples provided throughout the book equip the reader with an excellent set of tools for conducting research on numerous social and behavioral phenomena. John P. Hoffmann is a professor of sociology at Brigham Young University where he teaches research methods and applied statistics courses and conducts research on substance use and criminal behavior.

linear algebra hoffman: *Linear Algebra* Harold M. Edwards, 2004-10-15 * Proposes a radically new and thoroughly algorithmic approach to linear algebra * Each proof is an algorithm described in English that can be translated into the computer language the class is using and put to work solving problems and generating new examples * Designed for a one-semester course, this text gives the student many examples to work through and copious exercises to test their skills and extend their knowledge of the subject

linear algebra hoffman: *Problems and Theorems in Linear Algebra* Viktor Vasil'evich Prasolov, 1994-06-13 There are a number of very good books available on linear algebra. However, new results in linear algebra appear constantly, as do new, simpler, and better proofs of old results. Many of these results and proofs obtained in the past thirty years are accessible to undergraduate mathematics majors, but are usually ignored by textbooks. In addition, more than a few interesting old results are not covered in many books. In this book, the author provides the basics of linear algebra, with an emphasis on new results and on nonstandard and interesting proofs. The book features about 230 problems with complete solutions. It can serve as a supplementary text for an undergraduate or graduate algebra course.

linear algebra hoffman: *A Course in Algebra* Ernest Borisovich Vinberg, 2003-04-10 Presents modern algebra. This book includes such topics as affine and projective spaces, tensor

algebra, Galois theory, Lie groups, and associative algebras and their representations. It is suitable for independent study for advanced undergraduates and graduate students.

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Renowned professor and author Gilbert Strang demonstrates that linear algebra is a fascinating subject by showing both its beauty and value. While the mathematics is there, the effort is not all concentrated on proofs. Strang's emphasis is on understanding. He explains concepts, rather than deduces. This book is written in an informal and personal style and teaches real mathematics. The gears change in Chapter 2 as students reach the introduction of vector spaces. Throughout the book, the theory is motivated and reinforced by genuine applications, allowing pure mathematicians to teach applied mathematics.

linear algebra hoffman: Elementary Linear Algebra Lawrence E. Spence, 2013-07-29 For a sophomore-level course in Linear Algebra. Based on the recommendations of the Linear Algebra Curriculum Study Group, this introduction to linear algebra offers a matrix-oriented approach with more emphasis on problem solving and applications. Throughout the text, use of technology is encouraged. The focus is on matrix arithmetic, systems of linear equations, properties of Euclidean n -space, eigenvalues and eigenvectors, and orthogonality. Although matrix-oriented, the text provides a solid coverage of vector spaces.

linear algebra hoffman: Linear Algebra Jim Hefferon, 2015 This text covers a standard first course : Gauss's method, vector spaces, linear maps and matrices, determinants, and eigenvalues and eigenvectors. In addition, each chapter ends with some topics such as brief applications. What sets it apart is careful motivation, many examples, and extensive exercise sets. Together these help each student master the material of this course, and also help an instructor develop that student's level of mathematical maturity. This book has been available online for many years and is widely used, both in classrooms and for self-study. It is supported by worked answers for all exercises, beamer slides for classroom use, and a lab manual of computer work--Page 4 of cover.

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