

introduction to linear algebra gilbert strang

5th edition

Introduction to Linear Algebra, Gilbert Strang 5th Edition: A Comprehensive Guide

Introduction:

Are you embarking on the fascinating journey of learning linear algebra? Finding the right textbook can make or break your experience. Gilbert Strang's "Introduction to Linear Algebra, 5th Edition" is widely considered a cornerstone text, praised for its clarity, insightful explanations, and engaging approach. This comprehensive guide will delve into the key features of this popular textbook, providing you with a thorough understanding of its contents, structure, and what makes it stand out from other linear algebra resources. We'll explore its strengths, address potential challenges, and equip you with the knowledge to determine if it's the right fit for your learning style and goals.

What Makes Gilbert Strang's 5th Edition Unique?

Strang's "Introduction to Linear Algebra" isn't just another textbook; it's a learning experience. Unlike many texts that present linear algebra as a dry collection of theorems and proofs, Strang emphasizes the underlying intuition and practical applications. He masterfully weaves together theoretical concepts with real-world examples, making the material accessible and engaging even for beginners. The 5th edition further refines this approach with updated examples, clearer explanations, and even more emphasis on visual learning through the inclusion of enhanced visualizations and diagrams.

Key Features of the 5th Edition:

Emphasis on Intuition: Strang prioritizes building a strong intuitive understanding before diving into rigorous proofs. This makes the learning curve gentler for students who might otherwise find the subject daunting.

Real-World Applications: The book connects abstract concepts to practical applications in various fields, including engineering, computer science, physics, and economics. This helps students see the relevance and power of linear algebra.

Clear and Concise Writing Style: Strang's writing is renowned for its clarity and accessibility. He avoids unnecessary jargon and explains complex ideas in a straightforward manner.

Abundant Examples and Exercises: The book is rich in worked examples, providing students with step-by-step solutions and opportunities to practice their understanding. The exercises range in difficulty, catering to different learning levels.

Use of Visualizations: The fifth edition leverages visual aids like graphs and diagrams to reinforce concepts and make abstract ideas more concrete. This visual approach significantly enhances comprehension.

Updated Content: The 5th edition incorporates updates to reflect current advancements in the field and to enhance the clarity and flow of explanations.

Detailed Breakdown of the Book's Structure:

The book is logically structured to facilitate a gradual and comprehensive understanding of linear algebra. While the specific chapter titles and ordering might vary slightly across editions, the general structure remains consistent. Here's a general overview of the core components:

1. Introduction to Vectors and Matrices: This section lays the foundation, introducing basic vector and matrix operations, linear combinations, and spans. It establishes the core vocabulary and notation that will be used throughout the book.
1. Systems of Linear Equations: Here, the book delves into solving systems of linear equations, introducing methods like Gaussian elimination and LU factorization. The connection between systems of equations and matrices is clearly established.
1. Vector Spaces and Subspaces: This section introduces the abstract concept of vector spaces, providing a more formal mathematical framework. Subspaces, linear independence, basis, and dimension are key topics.
1. Orthogonality: This crucial chapter covers orthogonal vectors, orthogonal projections, and the Gram-Schmidt process. It's essential for many applications, including least squares problems.
1. Determinants: The concept of the determinant is introduced, along with its properties and applications in solving linear equations and finding eigenvalues.
1. Eigenvalues and Eigenvectors: This is a pivotal chapter that introduces eigenvalues and eigenvectors, crucial for understanding matrix diagonalization and many applications in various fields.
1. Positive Definite Matrices: This chapter focuses on a special class of matrices with important applications in optimization and other areas.

1. Linear Transformations: This section extends the concepts of matrices to linear transformations, providing a more geometric interpretation of linear algebra.
1. Applications: The book dedicates sections to various applications of linear algebra, illustrating the practical relevance of the concepts learned. These applications often involve real-world scenarios and examples.
1. Numerical Linear Algebra: A key focus in this edition touches upon the computational aspects of solving linear algebra problems efficiently.

Book Outline:

Introduction: Overview of linear algebra and its importance.

Chapter 1: Vectors and Matrices (Basic operations, linear combinations)

Chapter 2: Solving Linear Equations (Gaussian elimination, LU factorization)

Chapter 3: Vector Spaces (Subspaces, basis, dimension, linear independence)

Chapter 4: Orthogonality (Orthogonal vectors, projections, Gram-Schmidt)

Chapter 5: Determinants (Properties, applications)

Chapter 6: Eigenvalues and Eigenvectors (Diagonalization, applications)

Chapter 7: Positive Definite Matrices

Chapter 8: Linear Transformations

Chapter 9: Applications (Various fields, real-world examples)

Chapter 10: Numerical Linear Algebra

Conclusion: Summary and further learning resources

Explanation of Outline Points:

Each chapter builds upon the previous one, forming a logical progression of concepts. Chapter 1 introduces the fundamental building blocks, while later chapters explore more advanced topics. The applications chapter is particularly valuable, demonstrating the power and versatility of linear algebra in diverse fields. The inclusion of numerical linear algebra reinforces the practical aspects, bridging the gap between theory and computation.

Frequently Asked Questions (FAQs):

1. Is this book suitable for beginners? Yes, Strang's book is known for its clear explanations and intuitive approach, making it suitable even for students with limited prior mathematical background.

1. What prerequisites are needed? A basic understanding of high school algebra is sufficient. Some familiarity with calculus is helpful but not strictly necessary for the core concepts.

1. What makes this edition different from previous editions? The 5th edition includes updated examples, improved explanations, enhanced visualizations, and a strengthened focus on numerical methods.

1. Are there online resources to supplement the textbook? Yes, Professor Strang provides many supplementary materials online, including videos, solutions manuals, and interactive exercises.

1. Is this book suitable for self-study? Absolutely. The clear writing style, numerous examples, and online resources make it highly suitable for self-study.

1. What kind of problems are covered in the exercises? The exercises range from straightforward calculations to more challenging proof-based problems, providing a comprehensive range of practice opportunities.

1. Is this book suitable for different disciplines? Yes, linear algebra is fundamental to many fields, and this book covers applications relevant to engineering, computer science, physics, economics, and more.

1. What is the best way to approach learning from this book? Start with the introductory chapters, carefully working through the examples and exercises. Don't hesitate to revisit earlier concepts as needed.

1. Are there solutions manuals available? Yes, solutions manuals are available, but it's highly recommended to attempt the problems yourself before consulting the solutions.

Related Articles:

1. Linear Algebra for Machine Learning: Explores the specific applications of linear algebra in the field of machine learning.
1. Eigenvalues and Eigenvectors: A Deeper Dive: A more in-depth exploration of this crucial topic.
1. Solving Systems of Linear Equations: Advanced Techniques: Covers more advanced techniques beyond Gaussian elimination.
1. Introduction to Vector Spaces: A Geometric Approach: Provides a visual and intuitive understanding of vector spaces.
1. Linear Transformations and their Applications: Explores the geometric interpretation and applications of linear transformations.
1. The Power of Matrix Diagonalization: Delves into the significance and applications of matrix diagonalization.
1. Understanding Determinants and their Properties: A detailed analysis of determinants and their importance.
1. Numerical Methods for Solving Linear Systems: Covers efficient computational techniques for solving large linear systems.
1. Applications of Linear Algebra in Computer Graphics: Explains the role of linear algebra in creating and manipulating computer graphics.

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Gilbert Strang, 2016-08-11 Linear algebra is something all mathematics undergraduates and many other students, in subjects ranging from engineering to economics, have to learn. The fifth edition of this hugely successful textbook retains all the qualities of earlier editions, while at the same time seeing numerous minor improvements and major additions. The latter include: • A new chapter on singular values and singular vectors, including ways to analyze a matrix of data • A revised chapter on computing in linear algebra, with professional-level algorithms and code that can be downloaded for a variety of languages • A new section on linear algebra and cryptography • A new chapter on linear algebra in probability and statistics. A dedicated and active website also offers solutions to exercises as well as new exercises from many different sources (including practice problems, exams, and development of textbook examples), plus codes in MATLAB®, Julia, and Python.

introduction to linear algebra gilbert strang 5th edition: *Introduction to Linear Algebra*

Gilbert Strang, 1993 Book Description: Gilbert Strang's textbooks have changed the entire approach to learning linear algebra -- away from abstract vector spaces to specific examples of the four fundamental subspaces: the column space and nullspace of A and A' . *Introduction to Linear Algebra*, Fourth Edition includes challenge problems to complement the review problems that have been highly praised in previous editions. The basic course is followed by seven applications: differential equations, engineering, graph theory, statistics, Fourier methods and the FFT, linear programming, and computer graphics. Thousands of teachers in colleges and universities and now high schools are using this book, which truly explains this crucial subject.

introduction to linear algebra gilbert strang 5th edition: *Linear Algebra*

Kuldeep Singh, 2013-10 This book is intended for first- and second-year undergraduates arriving with average mathematics grades ... The strength of the text is in the large number of examples and the step-by-step explanation of each topic as it is introduced. It is compiled in a way that allows distance learning, with explicit solutions to all of the set problems freely available online <http://www.oup.co.uk/companion/singh> -- From preface.

introduction to linear algebra gilbert strang 5th edition: *Linear Algebra for Everyone*

Gilbert Strang, 2020-11-26 Linear algebra has become the subject to know for people in quantitative disciplines of all kinds. No longer the exclusive domain of mathematicians and engineers, it is now used everywhere there is data and everybody who works with data needs to know more. This new book from Professor Gilbert Strang, author of the acclaimed *Introduction to Linear Algebra*, now in its fifth edition, makes linear algebra accessible to everybody, not just those with a strong background in mathematics. It takes a more active start, beginning by finding independent columns of small matrices, leading to the key concepts of linear combinations and rank and column space. From there it passes on to the classical topics of solving linear equations, orthogonality, linear transformations and subspaces, all clearly explained with many examples and exercises. The last major topics are eigenvalues and the important singular value decomposition, illustrated with applications to differential equations and image compression. A final optional chapter explores the ideas behind deep learning.

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Gilbert Strang, 2006 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.

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Gilbert Strang, 2009-02-10 This leading textbook for first courses in linear algebra comes from the hugely experienced MIT lecturer and author Gilbert Strang. The book's tried and tested approach is direct, offering practical explanations and examples, while showing the beauty and variety of the

subject. Unlike most other linear algebra textbooks, the approach is not a repetitive drill. Instead it inspires an understanding of real mathematics. The book moves gradually and naturally from numbers to vectors to the four fundamental subspaces. This new edition includes challenge problems at the end of each section. Preview five complete sections at math.mit.edu/linearalgebra. Readers can also view freely available online videos of Gilbert Strang's 18.06 linear algebra course at MIT, via OpenCourseWare (ocw.mit.edu), that have been watched by over a million viewers. Also on the web (<http://web.mit.edu/18.06/www/>), readers will find years of MIT exam questions, MATLAB help files and problem sets to practise what they have learned.

introduction to linear algebra gilbert strang 5th edition: Linear Algebra Kenneth Hoffman, Ray Alden Kunze, 2015

introduction to linear algebra gilbert strang 5th edition: Linear Algebra and Learning from Data Gilbert Strang, 2019-01-31 Linear algebra and the foundations of deep learning, together at last! From Professor Gilbert Strang, acclaimed author of Introduction to Linear Algebra, comes Linear Algebra and Learning from Data, the first textbook that teaches linear algebra together with deep learning and neural nets. This readable yet rigorous textbook contains a complete course in the linear algebra and related mathematics that students need to know to get to grips with learning from data. Included are: the four fundamental subspaces, singular value decompositions, special matrices, large matrix computation techniques, compressed sensing, probability and statistics, optimization, the architecture of neural nets, stochastic gradient descent and backpropagation.

introduction to linear algebra gilbert strang 5th edition: 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.

introduction to linear algebra gilbert strang 5th edition: Calculus Gilbert Strang, Edwin Prine Herman, 2016-03-07 Published by OpenStax College, Calculus is designed for the typical two- or three-semester general calculus course, incorporating innovative features to enhance student learning. The book guides students through the core concepts of calculus and helps them understand how those concepts apply to their lives and the world around them. Due to the comprehensive nature of the material, we are offering the book in three volumes for flexibility and efficiency. Volume 2 covers integration, differential equations, sequences and series, and parametric equations and polar coordinates.--BC Campus website.

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introduction to linear algebra gilbert strang 5th edition: Introduction to Linear Algebra (Classic Version) Lee Johnson, Dean Riess, Jimmy Arnold, 2017-03-07 For courses in introductory linear algebra This title is part of the Pearson Modern Classics series. Pearson Modern Classics are acclaimed titles at a value price. Please visit www.pearsonhighered.com/math-classics-series for a complete list of titles. Introduction to Linear Algebra, 5th Edition is a foundation book that bridges both practical computation and theoretical principles. Due to its flexible table of contents, the book is accessible for both students majoring in the scientific, engineering, and social sciences, as well as

students that want an introduction to mathematical abstraction and logical reasoning. In order to achieve the text's flexibility, the book centers on 3 principal topics: matrix theory and systems of linear equations, elementary vector space concepts, and the eigenvalue problem. This highly adaptable text can be used for a one-quarter or one-semester course at the sophomore/junior level, or for a more advanced class at the junior/senior level.

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introduction to linear algebra gilbert strang 5th edition: 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.

introduction to linear algebra gilbert strang 5th edition: Student Solutions Manual for Strang's Linear Algebra and Its Applications Strang Strang, Gilbert Strang, Brett Coonley, Andy Bulman-Fleming, 2006 Includes detailed step-by-step solutions to selected odd-numbered problems.

introduction to linear algebra gilbert strang 5th edition: Linear Algebra Alan Tucker, 1993 Covers the fundamental role of linear algebra with both pure and applied mathematics as well as client disciplines such as engineering, the physical sciences and economics. This text examines the interrelationships amongst theory, computation and applications.

introduction to linear algebra gilbert strang 5th edition: No Bullshit Guide to Linear Algebra Ivan Savov, 2020-10-25 This textbook covers the material for an undergraduate linear algebra course: vectors, matrices, linear transformations, computational techniques, geometric constructions, and theoretical foundations. The explanations are given in an informal conversational tone. The book also contains 100+ problems and exercises with answers and solutions. A special feature of this textbook is the prerequisites chapter that covers topics from high school math, which are necessary for learning linear algebra. The presence of this chapter makes the book suitable for beginners and the general audience-readers need not be math experts to read this book. Another unique aspect of the book are the applications chapters (Ch 7, 8, and 9) that discuss applications of linear algebra to engineering, computer science, economics, chemistry, machine learning, and even quantum mechanics.

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course at the sophomore/junior level, or for a more advanced class at the junior/senior level.

introduction to linear algebra gilbert strang 5th edition: *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.

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introduction to linear algebra gilbert strang 5th edition: *Linear Algebra and Its Applications* David C. Lay, 2013-07-29 NOTE: This edition features the same content as the traditional text in a convenient, three-hole-punched, loose-leaf version. Books a la Carte also offer a great value--this format costs significantly less than a new textbook. Before purchasing, check with your instructor or review your course syllabus to ensure that you select the correct ISBN. Several versions of Pearson's MyLab & Mastering products exist for each title, including customized versions for individual schools, and registrations are not transferable. In addition, you may need a CourseID, provided by your instructor, to register for and use Pearson's MyLab & Mastering products. xxxxxxxxxxxxxxxx For courses in linear algebra. This package includes MyMathLab(R). With traditional linear algebra texts, the course is relatively easy for students during the early stages as material is presented in a familiar, concrete setting. However, when abstract concepts are introduced, students often hit a wall. Instructors seem to agree that certain concepts (such as linear independence, spanning, subspace, vector space, and linear transformations) are not easily understood and require time to assimilate. These concepts are fundamental to the study of linear algebra, so students' understanding of them is vital to mastering the subject. This text makes these concepts more accessible by introducing them early in a familiar, concrete $\mathbb{R}^n$ setting, developing them gradually, and returning to them throughout the text so that when they are discussed in the abstract, students are readily able to understand. Personalize learning with MyMathLab MyMathLab is an online homework, tutorial, and assessment program designed to work with this text to engage students and improve results. MyMathLab includes assignable algorithmic exercises, the complete eBook, interactive figures, tools to personalize learning, and more.

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implemented in MATLAB and in Python. Unique aspects of this book: - Clear and comprehensible explanations of concepts and theories in linear algebra. - Several distinct explanations of the same ideas, which is a proven technique for learning. - Visualization using graphs, which strengthens the geometric intuition of linear algebra. - Implementations in MATLAB and Python. Com'on, in the real world, you never solve math problems by hand! You need to know how to implement math in software! - Beginner to intermediate topics, including vectors, matrix multiplications, least-squares projections, eigendecomposition, and singular-value decomposition. - Strong focus on modern applications-oriented aspects of linear algebra and matrix analysis. - Intuitive visual explanations of diagonalization, eigenvalues and eigenvectors, and singular value decomposition. - Codes (MATLAB and Python) are provided to help you understand and apply linear algebra concepts on computers. - A combination of hand-solved exercises and more advanced code challenges. Math is not a spectator sport!

introduction to linear algebra gilbert strang 5th edition: *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.

introduction to linear algebra gilbert strang 5th edition: Applied Linear Algebra Peter J. Olver, Chehrzad Shakiban, 2018-05-30 This textbook develops the essential tools of linear algebra, with the goal of imparting technique alongside contextual understanding. Applications go hand-in-hand with theory, each reinforcing and explaining the other. This approach encourages students to develop not only the technical proficiency needed to go on to further study, but an appreciation for when, why, and how the tools of linear algebra can be used across modern applied mathematics. Providing an extensive treatment of essential topics such as Gaussian elimination, inner products and norms, and eigenvalues and singular values, this text can be used for an in-depth first course, or an application-driven second course in linear algebra. In this second edition, applications have been updated and expanded to include numerical methods, dynamical systems, data analysis, and signal processing, while the pedagogical flow of the core material has been improved. Throughout, the text emphasizes the conceptual connections between each application and the underlying linear algebraic techniques, thereby enabling students not only to learn how to apply the mathematical tools in routine contexts, but also to understand what is required to adapt to unusual or emerging problems. No previous knowledge of linear algebra is needed to approach this text, with single-variable calculus as the only formal prerequisite. However, the reader will need to draw upon some mathematical maturity to engage in the increasing abstraction inherent to the subject. Once equipped with the main tools and concepts from this book, students will be prepared for further study in differential equations, numerical analysis, data science and statistics, and a broad range of applications. The first author's text, *Introduction to Partial Differential Equations*, is an ideal companion volume, forming a natural extension of the linear mathematical methods developed here.

introduction to linear algebra gilbert strang 5th edition: Linear Algebra: A Modern Introduction David Poole, 2014-03-19 David Poole's innovative LINEAR ALGEBRA: A MODERN INTRODUCTION, 4e emphasizes a vectors approach and better prepares students to make the transition from computational to theoretical mathematics. Balancing theory and applications, the book is written in a conversational style and combines a traditional presentation with a focus on student-centered learning. Theoretical, computational, and applied topics are presented in a flexible yet integrated way. Stressing geometric understanding before computational techniques, vectors and vector geometry are introduced early to help students visualize concepts and develop

mathematical maturity for abstract thinking. Additionally, the book includes ample applications drawn from a variety of disciplines, which reinforce the fact that linear algebra is a valuable tool for modeling real-life problems. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

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Gilbert Strang, 2012-04-26 The renowned mathematician and educator Gilbert Strang presents a collection of expository papers on the theory and applications of linear algebra, accompanied by video lectures on <http://ocw.mit.edu>. The essays are diverse in scope and range from purely theoretical studies on deep fundamental principles of matrix algebra to discussions on the teaching of calculus and an examination of the mathematical foundations of aspects of computational engineering. One thing these essays have in common is the way that they express both the importance and the beauty of the subject, as well as the author's passion for mathematics. This text will be of practical use to students and researchers across a whole spectrum of numerate disciplines. Furthermore, this collection provides a unique perspective on mathematics and the communication thereof as a human endeavour, complemented as these essays are by commentary from the author regarding their provenance and the reaction to them.

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introduction to linear algebra gilbert strang 5th edition: Groups, Matrices, and Vector Spaces James B. Carrell, 2017-09-02 This unique text provides a geometric approach to group theory and linear algebra, bringing to light the interesting ways in which these subjects interact. Requiring

few prerequisites beyond understanding the notion of a proof, the text aims to give students a strong foundation in both geometry and algebra. Starting with preliminaries (relations, elementary combinatorics, and induction), the book then proceeds to the core topics: the elements of the theory of groups and fields (Lagrange's Theorem, cosets, the complex numbers and the prime fields), matrix theory and matrix groups, determinants, vector spaces, linear mappings, eigentheory and diagonalization, Jordan decomposition and normal form, normal matrices, and quadratic forms. The final two chapters consist of a more intensive look at group theory, emphasizing orbit stabilizer methods, and an introduction to linear algebraic groups, which enriches the notion of a matrix group. Applications involving symmetry groups, determinants, linear coding theory and cryptography are interwoven throughout. Each section ends with ample practice problems assisting the reader to better understand the material. Some of the applications are illustrated in the chapter appendices. The author's unique melding of topics evolved from a two semester course that he taught at the University of British Columbia consisting of an undergraduate honors course on abstract linear algebra and a similar course on the theory of groups. The combined content from both makes this rare text ideal for a year-long course, covering more material than most linear algebra texts. It is also optimal for independent study and as a supplementary text for various professional applications. Advanced undergraduate or graduate students in mathematics, physics, computer science and engineering will find this book both useful and enjoyable.

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introduction to linear algebra gilbert strang 5th edition: Linear Algebra As An Introduction To Abstract Mathematics Bruno Nachtergaele, Anne Schilling, Isaiah Lankham, 2015-11-30 This is an introductory textbook designed for undergraduate mathematics majors with an emphasis on abstraction and in particular, the concept of proofs in the setting of linear algebra. Typically such a student would have taken calculus, though the only prerequisite is suitable mathematical grounding. The purpose of this book is to bridge the gap between the more conceptual and computational oriented undergraduate classes to the more abstract oriented classes. The book begins with systems of linear equations and complex numbers, then relates these to the abstract notion of linear maps on finite-dimensional vector spaces, and covers diagonalization, eigenspaces, determinants, and the Spectral Theorem. Each chapter concludes with both proof-writing and computational exercises.

introduction to linear algebra gilbert strang 5th edition: 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.

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