

asu linear algebra

ASU Linear Algebra: A Comprehensive Guide for Students

Introduction:

Are you an ASU student tackling the often-challenging world of linear algebra? Feeling overwhelmed by vectors, matrices, and transformations? This comprehensive guide is designed to help you conquer your ASU linear algebra coursework, providing a clear roadmap to success. We'll cover key concepts, helpful resources available at ASU, common pitfalls to avoid, and strategies to master this fundamental area of mathematics. Whether you're a math major or just fulfilling a requirement, this guide will equip you with the knowledge and resources you need to thrive.

I. Understanding the ASU Linear Algebra Curriculum:

Linear algebra at ASU, like most universities, forms the bedrock for many advanced courses in mathematics, computer science, engineering, and physics. The specific course content will vary depending on the course level (e.g., MAT 270, MAT 342, etc.), but generally covers:

Vectors and Vector Spaces: Understanding vectors, vector addition, scalar multiplication, linear combinations, and spanning sets. This foundational knowledge is crucial for everything that follows.

Matrices and Matrix Operations: Learning matrix addition, scalar multiplication, matrix multiplication, and understanding the significance of different matrix types (e.g., identity matrices, invertible matrices).

Linear Transformations: Grasping the concept of linear transformations, their representation through matrices, and understanding concepts like kernel and range.

Eigenvalues and Eigenvectors: One of the most important topics in linear algebra, understanding eigenvalues and eigenvectors is crucial for solving systems of differential equations and many other applications.

Diagonalization and Applications: Learning how to diagonalize matrices and applying this to solve linear systems efficiently.

Inner Product Spaces and Orthogonality: Exploring inner product spaces, orthogonality, Gram-Schmidt process, and their applications in data analysis and other fields.

II. Navigating ASU Resources for Linear Algebra Success:

ASU offers a wealth of resources to help students succeed in linear algebra. Make sure you leverage these effectively:

Professor's Office Hours: Attend office hours regularly. This is your chance to ask clarifying questions, get personalized help, and build a rapport with your instructor.

Tutoring Services: ASU likely offers tutoring services specifically for math and linear

algebra. Don't hesitate to utilize this valuable support.

Study Groups: Forming a study group with classmates allows for collaborative learning and can significantly improve understanding.

Online Resources: ASU's library likely provides access to online textbooks, videos, and practice problems. Khan Academy, MIT OpenCourseware, and 3Blue1Brown (YouTube channel) are also excellent free online resources.

Textbook Resources: Your textbook will contain numerous examples and practice problems. Make sure to work through these diligently.

III. Common Pitfalls to Avoid in ASU Linear Algebra:

Many students struggle with specific aspects of linear algebra. Knowing the common pitfalls can help you avoid them:

Not Understanding the Fundamentals: A weak grasp of basic concepts like vectors and matrices will make more advanced topics extremely difficult.

Memorization over Understanding: Linear algebra is not about memorizing formulas; it's about understanding the underlying concepts and their applications.

Lack of Practice: Linear algebra requires consistent practice. The more problems you solve, the better you'll understand the material.

Ignoring Conceptual Understanding: Focus on understanding why things work the way they do, not just how to perform calculations.

Procrastination: Linear algebra builds upon itself. Falling behind early will make catching up very difficult.

IV. Strategies for Mastering ASU Linear Algebra:

To excel in your ASU linear algebra course, adopt these effective learning strategies:

Consistent Practice: Regularly work through practice problems from your textbook, online resources, and past exams.

Active Recall: Test yourself regularly without looking at your notes or textbook.

Spaced Repetition: Review previously learned concepts at increasing intervals to improve long-term retention.

Seek Help Early: Don't wait until you're completely lost to seek help. Get clarification on confusing concepts immediately.

Connect Concepts: Look for connections between different topics within linear algebra. This holistic understanding will strengthen your overall grasp.

V. Beyond the Classroom: Real-World Applications of Linear Algebra:

Linear algebra is not just a theoretical subject; it has numerous real-world applications:

Computer Graphics: Used extensively in 3D modeling, animation, and game development.

Machine Learning: Essential for various machine learning algorithms, including linear regression and support vector machines.

Data Science: Used for data analysis, dimensionality reduction, and pattern recognition.

Engineering: Used in structural analysis, circuit analysis, and control systems.

Physics: Used in quantum mechanics, classical mechanics, and electromagnetism.

VI. A Sample ASU Linear Algebra Course Outline:

This is a hypothetical outline and may not match your specific course. Consult your syllabus for details.

Introduction to Vectors and Vector Spaces: Definitions, operations, linear independence, basis, dimension.

Matrices and Matrix Operations: Matrix addition, multiplication, transpose, inverse.

Systems of Linear Equations: Gaussian elimination, row reduction, solutions.

Linear Transformations: Definition, matrix representation, kernel, range, isomorphism.

Eigenvalues and Eigenvectors: Definition, computation, diagonalization.

Inner Product Spaces: Definition, properties, Gram-Schmidt process.

Applications of Linear Algebra: Selected applications depending on the course.

VII. Conclusion:

Mastering linear algebra at ASU requires dedication, consistent effort, and the utilization of available resources. By understanding the key concepts, utilizing ASU's support systems, and employing effective learning strategies, you can confidently tackle this crucial subject and build a strong foundation for future academic and professional success.

Frequently Asked Questions (FAQs):

1. What is the best way to prepare for the ASU linear algebra final exam? Review all key concepts, practice past exams, and seek clarification on any areas you find challenging.
1. Are calculators allowed during ASU linear algebra exams? Check your syllabus; some exams may allow basic calculators, while others may not allow any.
1. What are the prerequisites for ASU linear algebra courses? This varies depending on the specific course; check the course description for prerequisites.
1. How much time should I dedicate to studying linear algebra each week? The required study time depends on your learning style and the course difficulty, but plan for at least 5-10 hours per week.

1. What are some good textbooks for ASU linear algebra? Your instructor will likely recommend a specific textbook; consult your syllabus.
1. What if I'm struggling to understand a specific concept? Attend office hours, utilize tutoring services, and form a study group with classmates.
1. Are there online resources to help me with ASU linear algebra? Yes, many online resources like Khan Academy, MIT OpenCourseware, and 3Blue1Brown are excellent supplementary materials.
1. Is linear algebra important for computer science? Yes, linear algebra is fundamental for many areas of computer science, including machine learning, computer graphics, and data science.
1. What career paths benefit from a strong understanding of linear algebra? Numerous fields, including data science, machine learning, engineering, and finance, require a solid foundation in linear algebra.

Related Articles:

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1. Eigenvalues and Eigenvectors: A Practical Guide: A comprehensive explanation of eigenvalues and eigenvectors and their applications.
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asu linear algebra: Introduction to Applied Linear Algebra Stephen Boyd, Lieven Vandenberghe, 2018-06-07 A groundbreaking introduction to vectors, matrices, and least squares for engineering applications, offering a wealth of practical examples.

asu linear algebra: College Algebra Jay Abramson, 2018-01-07 College Algebra provides a comprehensive exploration of algebraic principles and meets scope and sequence requirements for a typical introductory algebra course. The modular approach and richness of content ensure that the book meets the needs of a variety of courses. College Algebra offers a wealth of examples with detailed, conceptual explanations, building a strong foundation in the material before asking students to apply what they've learned. Coverage and Scope In determining the concepts, skills, and topics to cover, we engaged dozens of highly experienced instructors with a range of student audiences. The resulting scope and sequence proceeds logically while allowing for a significant amount of flexibility in instruction. Chapters 1 and 2 provide both a review and foundation for study of Functions that begins in Chapter 3. The authors recognize that while some institutions may find this material a prerequisite, other institutions have told us that they have a cohort that need the

prerequisite skills built into the course. Chapter 1: Prerequisites Chapter 2: Equations and Inequalities Chapters 3-6: The Algebraic Functions Chapter 3: Functions Chapter 4: Linear Functions Chapter 5: Polynomial and Rational Functions Chapter 6: Exponential and Logarithm Functions Chapters 7-9: Further Study in College Algebra Chapter 7: Systems of Equations and Inequalities Chapter 8: Analytic Geometry Chapter 9: Sequences, Probability and Counting Theory

asu linear algebra: Discrete Mathematical Structures for Computer Science Bernard Kolman, Robert C. Busby, 1987 This text has been designed as a complete introduction to discrete mathematics, primarily for computer science majors in either a one or two semester course. The topics addressed are of genuine use in computer science, and are presented in a logically coherent fashion. The material has been organized and interrelated to minimize the mass of definitions and the abstraction of some of the theory. For example, relations and directed graphs are treated as two aspects of the same mathematical idea. Whenever possible each new idea uses previously encountered material, and then developed in such a way that it simplifies the more complex ideas that follow.

asu linear algebra: Algebra and Trigonometry Jay P. Abramson, Valeree Falduto, Rachael Gross (Mathematics teacher), David Lippman, Rick Norwood, Melonie Rasmussen, Nicholas Belloit, Jean-Marie Magnier, Harold Whipple, Christina Fernandez, 2015-02-13 The text is suitable for a typical introductory algebra course, and was developed to be used flexibly. While the breadth of topics may go beyond what an instructor would cover, the modular approach and the richness of content ensures that the book meets the needs of a variety of programs.--Page 1.

asu linear algebra: Graphs and Matrices Ravindra B. Bapat, 2014-09-19 This new edition illustrates the power of linear algebra in the study of graphs. The emphasis on matrix techniques is greater than in other texts on algebraic graph theory. Important matrices associated with graphs (for example, incidence, adjacency and Laplacian matrices) are treated in detail. Presenting a useful overview of selected topics in algebraic graph theory, early chapters of the text focus on regular graphs, algebraic connectivity, the distance matrix of a tree, and its generalized version for arbitrary graphs, known as the resistance matrix. Coverage of later topics include Laplacian eigenvalues of threshold graphs, the positive definite completion problem and matrix games based on a graph. Such an extensive coverage of the subject area provides a welcome prompt for further exploration. The inclusion of exercises enables practical learning throughout the book. In the new edition, a new chapter is added on the line graph of a tree, while some results in Chapter 6 on Perron-Frobenius theory are reorganized. Whilst this book will be invaluable to students and researchers in graph theory and combinatorial matrix theory, it will also benefit readers in the sciences and engineering.

asu linear algebra: Spectral Feature Selection for Data Mining Zheng Alan Zhao, Huan Liu, 2011-12-14 Spectral Feature Selection for Data Mining introduces a novel feature selection technique that establishes a general platform for studying existing feature selection algorithms and developing new algorithms for emerging problems in real-world applications. This technique represents a unified framework for supervised, unsupervised, and semisupervised

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asu linear algebra: Quantum Computing for Everyone Chris Bernhardt, 2019-03-19 An accessible introduction to an exciting new area in computation, explaining such topics as qubits, entanglement, and quantum teleportation for the general reader. Quantum computing is a beautiful fusion of quantum physics and computer science, incorporating some of the most stunning ideas from twentieth-century physics into an entirely new way of thinking about computation. In this book, Chris Bernhardt offers an introduction to quantum computing that is accessible to anyone who is comfortable with high school mathematics. He explains qubits, entanglement, quantum teleportation, quantum algorithms, and other quantum-related topics as clearly as possible for the general reader. Bernhardt, a mathematician himself, simplifies the mathematics as much as he can and provides elementary examples that illustrate both how the math works and what it means. Bernhardt introduces the basic unit of quantum computing, the qubit, and explains how the qubit can be measured; discusses entanglement—which, he says, is easier to describe mathematically than verbally—and what it means when two qubits are entangled (citing Einstein's characterization of what happens when the measurement of one entangled qubit affects the second as “spooky action at a distance”); and introduces quantum cryptography. He recaps standard topics in classical computing—bits, gates, and logic—and describes Edward Fredkin's ingenious billiard ball computer. He defines quantum gates, considers the speed of quantum algorithms, and describes the building of quantum computers. By the end of the book, readers understand that quantum computing and classical computing are not two distinct disciplines, and that quantum computing is the fundamental form of computing. The basic unit of computation is the qubit, not the bit.

asu linear algebra: Linear State-Space Control Systems Robert L. Williams, II, Douglas A. Lawrence, 2007-02-09 The book blends readability and accessibility common to undergraduate control systems texts with the mathematical rigor necessary to form a solid theoretical foundation. Appendices cover linear algebra and provide a Matlab overview and files. The reviewers pointed out that this is an ambitious project but one that will pay off because of the lack of good up-to-date textbooks in the area.

asu linear algebra: Research and Development in University Mathematics Education Viviane Durand-Guerrier, Reinhard Hochmuth, Elena Nardi, Carl Winsløw, 2021-04-16 In the last thirty years or so, the need to address the challenges of teaching and learning mathematics at university level has become increasingly appreciated by university mathematics teachers, and beyond, by educational institutions around the world. Indeed, mathematics is both a condition and an obstacle to success for students in many educational programmes vital to the 21st century knowledge society, for example in pure and applied mathematics, engineering, natural sciences, technology, economics, finance, management and so on. This breadth of impact of mathematics implies the urgency of developing research in university mathematics education, and of sharing results of this research widely. This book provides a bespoke opportunity for an international audience of researchers in didactics of mathematics, mathematicians and any teacher or researcher with an interest in this area to be informed about state-of-the-art developments and to heed future research agendas. This book emerged from the activities of the research project INDRUM (acronym for International Network for Didactic Research in University Mathematics), which aims to contribute to the development of research in didactics of mathematics at all levels of tertiary education, with a particular concern for the development of early-career researchers in the field and for dialogue with university mathematicians. The aim of the book is to provide a deep synthesis of the research field as it appears through two INDRUM conferences organised in 2016 and 2018. It is an original contribution which highlights key research perspectives, addresses seminal theoretical and methodological issues and reports substantial results concerning the teaching and learning of mathematics at university level, including the teaching and learning of specific topics in advanced mathematics across a wide range of university programmes.

asu linear algebra: Linear Models in Statistics Alvin C. Rencher, G. Bruce Schaalje, 2008-01-07 The essential introduction to the theory and application of linear models—now in a valuable new edition Since most advanced statistical tools are generalizations of the linear model, it is necessary

to first master the linear model in order to move forward to more advanced concepts. The linear model remains the main tool of the applied statistician and is central to the training of any statistician regardless of whether the focus is applied or theoretical. This completely revised and updated new edition successfully develops the basic theory of linear models for regression, analysis of variance, analysis of covariance, and linear mixed models. Recent advances in the methodology related to linear mixed models, generalized linear models, and the Bayesian linear model are also addressed. *Linear Models in Statistics, Second Edition* includes full coverage of advanced topics, such as mixed and generalized linear models, Bayesian linear models, two-way models with empty cells, geometry of least squares, vector-matrix calculus, simultaneous inference, and logistic and nonlinear regression. Algebraic, geometrical, frequentist, and Bayesian approaches to both the inference of linear models and the analysis of variance are also illustrated. Through the expansion of relevant material and the inclusion of the latest technological developments in the field, this book provides readers with the theoretical foundation to correctly interpret computer software output as well as effectively use, customize, and understand linear models. This modern Second Edition features: New chapters on Bayesian linear models as well as random and mixed linear models Expanded discussion of two-way models with empty cells Additional sections on the geometry of least squares Updated coverage of simultaneous inference The book is complemented with easy-to-read proofs, real data sets, and an extensive bibliography. A thorough review of the requisite matrix algebra has been added for transitional purposes, and numerous theoretical and applied problems have been incorporated with selected answers provided at the end of the book. A related Web site includes additional data sets and SAS® code for all numerical examples. *Linear Model in Statistics, Second Edition* is a must-have book for courses in statistics, biostatistics, and mathematics at the upper-undergraduate and graduate levels. It is also an invaluable reference for researchers who need to gain a better understanding of regression and analysis of variance.

asu linear algebra: How to Prove It Daniel J. Velleman, 2006-01-16 Many students have trouble the first time they take a mathematics course in which proofs play a significant role. This new edition of Velleman's successful text will prepare students to make the transition from solving problems to proving theorems by teaching them the techniques needed to read and write proofs. The book begins with the basic concepts of logic and set theory, to familiarize students with the language of mathematics and how it is interpreted. These concepts are used as the basis for a step-by-step breakdown of the most important techniques used in constructing proofs. The author shows how complex proofs are built up from these smaller steps, using detailed 'scratch work' sections to expose the machinery of proofs about the natural numbers, relations, functions, and infinite sets. To give students the opportunity to construct their own proofs, this new edition contains over 200 new exercises, selected solutions, and an introduction to Proof Designer software. No background beyond standard high school mathematics is assumed. This book will be useful to anyone interested in logic and proofs: computer scientists, philosophers, linguists, and of course mathematicians.

asu linear algebra: Mathematical Models for Communicable Diseases Fred Brauer, Carlos Castillo-Chavez, 2012-01-01 This graduate-level textbook appeals to readers interested in the mathematical theory of disease transmission models. It is self-contained and accessible to readers who are comfortable with calculus, elementary differential equations, and linear algebra. The book provides insight into modeling cross-immunity between different disease strains (such as influenza) and the synergistic interactions between multiple diseases (e.g., HIV and tuberculosis); diseases transmitted by viral agents, bacteria, and vectors (e.g., mosquitos transmitting malaria to humans); and both epidemic and endemic disease occurrences.

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students a fine balance between abstraction/theory and computational skills. The emphasis is on not just teaching how to read a proof but also on how to write a proof.

asu linear algebra: *Elementary Differential Equations* William E. Boyce, Richard C. DiPrima, Douglas B. Meade, 2017-08-14 With Wiley's Enhanced E-Text, you get all the benefits of a downloadable, reflowable eBook with added resources to make your study time more effective, including: Embedded & searchable equations, figures & tables Math XML Index with linked pages numbers for easy reference Redrawn full color figures to allow for easier identification *Elementary Differential Equations*, 11th Edition is written from the viewpoint of the applied mathematician, whose interest in differential equations may sometimes be quite theoretical, sometimes intensely practical, and often somewhere in between. The authors have sought to combine a sound and accurate (but not abstract) exposition of the elementary theory of differential equations with considerable material on methods of solution, analysis, and approximation that have proved useful in a wide variety of applications. While the general structure of the book remains unchanged, some notable changes have been made to improve the clarity and readability of basic material about differential equations and their applications. In addition to expanded explanations, the 11th edition includes new problems, updated figures and examples to help motivate students. The program is primarily intended for undergraduate students of mathematics, science, or engineering, who typically take a course on differential equations during their first or second year of study. The main prerequisite for engaging with the program is a working knowledge of calculus, gained from a normal two] or three] semester course sequence or its equivalent. Some familiarity with matrices will also be helpful in the chapters on systems of differential equations.

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the back of the book

asu linear algebra: Calculus For Dummies Mark Ryan, 2016-05-18 Slay the calculus monster with this user-friendly guide *Calculus For Dummies*, 2nd Edition makes calculus manageable—even if you're one of the many students who sweat at the thought of it. By breaking down differentiation and integration into digestible concepts, this guide helps you build a stronger foundation with a solid understanding of the big ideas at work. This user-friendly math book leads you step-by-step through each concept, operation, and solution, explaining the how and why in plain English instead of math-speak. Through relevant instruction and practical examples, you'll soon learn that real-life calculus isn't nearly the monster it's made out to be. Calculus is a required course for many college majors, and for students without a strong math foundation, it can be a real barrier to graduation. Breaking that barrier down means recognizing calculus for what it is—simply a tool for studying the ways in which variables interact. It's the logical extension of the algebra, geometry, and trigonometry you've already taken, and *Calculus For Dummies*, 2nd Edition proves that if you can master those classes, you can tackle calculus and win. Includes foundations in algebra, trigonometry, and pre-calculus concepts Explores sequences, series, and graphing common functions Instructs you how to approximate area with integration Features things to remember, things to forget, and things you can't get away with Stop fearing calculus, and learn to embrace the challenge. With this comprehensive study guide, you'll gain the skills and confidence that make all the difference. *Calculus For Dummies*, 2nd Edition provides a roadmap for success, and the backup you need to get there.

asu linear algebra: Discrete Mathematics Oscar Levin, 2016-08-16 This gentle introduction to discrete mathematics is written for first and second year math majors, especially those who intend to teach. The text began as a set of lecture notes for the discrete mathematics course at the University of Northern Colorado. This course serves both as an introduction to topics in discrete math and as the introduction to proof course for math majors. The course is usually taught with a large amount of student inquiry, and this text is written to help facilitate this. Four main topics are covered: counting, sequences, logic, and graph theory. Along the way proofs are introduced, including proofs by contradiction, proofs by induction, and combinatorial proofs. The book contains over 360 exercises, including 230 with solutions and 130 more involved problems suitable for homework. There are also Investigate! activities throughout the text to support active, inquiry based learning. While there are many fine discrete math textbooks available, this text has the following advantages: It is written to be used in an inquiry rich course. It is written to be used in a course for future math teachers. It is open source, with low cost print editions and free electronic editions.

asu linear algebra: An Introduction to Analysis Robert C. Gunning, 2018-03-20 An essential undergraduate textbook on algebra, topology, and calculus *An Introduction to Analysis* is an essential primer on basic results in algebra, topology, and calculus for undergraduate students considering advanced degrees in mathematics. Ideal for use in a one-year course, this unique textbook also introduces students to rigorous proofs and formal mathematical writing--skills they need to excel. With a range of problems throughout, *An Introduction to Analysis* treats n-dimensional calculus from the beginning—differentiation, the Riemann integral, series, and differential forms and Stokes's theorem—enabling students who are serious about mathematics to progress quickly to more challenging topics. The book discusses basic material on point set topology, such as normed and metric spaces, topological spaces, compact sets, and the Baire category theorem. It covers linear algebra as well, including vector spaces, linear mappings, Jordan normal form, bilinear mappings, and normal mappings. Proven in the classroom, *An Introduction to Analysis* is the first textbook to bring these topics together in one easy-to-use and comprehensive volume. Provides a rigorous introduction to calculus in one and several variables Introduces students to basic topology Covers topics in linear algebra, including matrices, determinants, Jordan normal form, and bilinear and normal mappings Discusses differential forms and Stokes's theorem in n dimensions Also covers the Riemann integral, integrability, improper integrals, and series expansions

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regression with one predictor variable; Inferences in regression and correlation analysis; Diagnostic and remedial measures; Simultaneous inferences and other topics in regression analysis; Matrix approach to simple linear regression analysis; Multiple linear regression; Nonlinear regression; Design and analysis of single-factor studies; Multi-factor studies; Specialized study designs.

asu linear algebra: Engineering Mathematics Handbook Jan J. Tuma, 1970

asu linear algebra: *Algebra and Applications 2* Abdenacer Makhlouf, 2021-12-29 This book is part of Algebra and Geometry, a subject within the SCIENCES collection published by ISTE and Wiley, and the second of three volumes specifically focusing on algebra and its applications. Algebra and Applications 2 centers on the increasing role played by combinatorial algebra and Hopf algebras, including an overview of the basic theories on non-associative algebras, operads and (combinatorial) Hopf algebras. The chapters are written by recognized experts in the field, providing insight into new trends, as well as a comprehensive introduction to the theory. The book incorporates self-contained surveys with the main results, applications and perspectives. The chapters in this volume cover a wide variety of algebraic structures and their related topics. Alongside the focal topic of combinatorial algebra and Hopf algebras, non-associative algebraic structures in iterated integrals, chronological calculus, differential equations, numerical methods, control theory, non-commutative symmetric functions, Lie series, descent algebras, Butcher groups, chronological algebras, Magnus expansions and Rota-Baxter algebras are explored. Algebra and Applications 2 is of great interest to graduate students and researchers. Each chapter combines some of the features of both a graduate level textbook and of research level surveys.

asu linear algebra: *Linear Algebra with Applications* Jeffrey Holt, 2017-02-09 Holts Linear Algebra with Applications, Second Edition, blends computational and conceptual topics throughout to prepare students for the rigors of conceptual thinking in an abstract setting. The early treatment of conceptual topics in the context of Euclidean space gives students more time, and a familiar setting, in which to absorb them. This organization also makes it possible to treat eigenvalues and eigenvectors earlier than in most texts. Abstract vector spaces are introduced later, once students have developed a solid conceptual foundation. Concepts and topics are frequently accompanied by applications to provide context and motivation. Because many students learn by example, Linear Algebra with Applications provides a large number of representative examples, over and above those used to introduce topics. The text also has over 2500 exercises, covering computational and conceptual topics over a range of difficulty levels.

asu linear algebra: Teaching School Mathematics: Pre-Algebra Hung-Hsi Wu., 2016-06-29 This is a systematic exposition of a major part of the mathematics of grades 5 to 8 (excluding statistics), written specifically for Common Core era teachers. It differs from other books for teachers in that the mathematics is correct, in the sense that all the concepts are clearly and correctly defined, and a grade-appropriate explanation (that is, proof) is given for every assertion. For example, it gives a precise definition of percent and explains how to use the definition to do all the standard problems about percent in an entirely routine manner. It also gives a leisurely explanation for "negative times negative is positive". Another key feature is an intuitive introduction to plane geometry via rotations, translations, reflections, and dilations that, instead of treating these transformations as merely fun activities, shows how they make sense of the usual geometric topics in middle school, including congruence, similarity, length, area, and volume. In short, the readers will find in this volume a clear explanation of whatever was once puzzling to them in the mathematics of grades 5 to 8.

asu linear algebra: Curves and Surfaces for CAGD Gerald E. Farin, 2002 Preface -- Chapter 1 P. Bézier: How a Simple System Was Born -- Chapter 2 Introductory Material -- Chapter 3 Linear Interpolation -- Chapter 4 The de Casteljau Algorithm -- Chapter 5 The Bernstein Form of a Bézier Curve -- Chapter 6 Bézier Curve Topics -- Chapter 7 Polynomial Curve Constructions -- Chapter 8 B-Spline Curves -- Chapter 9 Constructing Spline Curves -- Chapter 10 W. Boehm: Differential Geometry I -- Chapter 11 Geometric Continuity -- Chapter 12 Conic Sections -- Chapter 13 Rational

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