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Introduction to Representation Theory
Abstract Algebra
An Invitation to General Algebra and Universal Constructions
Admissible Solutions of Hyperbolic Conservation Laws
Algebra für Einsteiger
Contributions to Algebraic Geometry in Honor of Oscar Zariski
Algebraic Geometry and Commutative Algebra
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Abstract Algebra
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Algebra: Abstract and Concrete, edition 2.6
Groups, Rings and Fields
Linear Algebra Problem Book
Introduction to Linear Algebra
A History of Abstract Algebra
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A Book of Abstract Algebra
Abstract Algebra
Computer Algebra and Symbolic Computation
Advanced Modern Algebra: Third Edition, Part 2
Representations and Characters of Groups
Geometry and Topology
Undergraduate Algebra
Barsotti Symposium in Algebraic Geometry
Abstract Algebra
The Cauchy-Schwarz Master Class
Elements of Number Theory
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Introduction to Representation Theory

Very roughly speaking, representation theory studies symmetry in linear spaces. It is a beautiful mathematical subject which has many applications, ranging from number theory and combinatorics to geometry, probability theory, quantum mechanics, and quantum field theory. The goal of this book is to

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give a "holistic" introduction to representation theory, presenting it as a unified subject which studies representations of associative algebras and treating the representation theories of groups, Lie algebras, and quivers as special cases. Using this approach, the book covers a number of standard topics in the representation theories of these structures. Theoretical material in the book is supplemented by many problems and exercises which touch upon a lot of additional topics; the more difficult exercises are provided with hints. The book is designed as a textbook for advanced undergraduate and beginning graduate students. It should be accessible to students with a strong background in linear algebra and a basic knowledge of abstract algebra.

Abstract Algebra

The Second Edition of this classic text maintains the clear exposition, logical organization, and accessible breadth of coverage that have been its hallmarks. It plunges directly into algebraic structures and incorporates an unusually large number of examples to clarify abstract concepts as they arise. Proofs of theorems do more than just prove the stated results; Saracino examines them so readers gain a better impression of where the proofs come from and why they proceed as they do. Most of the exercises range from easy to moderately difficult and ask for understanding of ideas rather than flashes of insight. The new edition introduces five new sections on field extensions and Galois theory, increasing its versatility by making it appropriate for a two-semester as well as a one-semester course.

An Invitation to General Algebra and Universal Constructions

Abstract Algebra: Theory and Applications is an open-source textbook that is designed to teach the

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principles and theory of abstract algebra to college juniors and seniors in a rigorous manner. Its strengths include a wide range of exercises, both computational and theoretical, plus many non-trivial applications. The first half of the book presents group theory, through the Sylow theorems, with enough material for a semester-long course. The second half is suitable for a second semester and presents rings, integral domains, Boolean algebras, vector spaces, and fields, concluding with Galois Theory.

Admissible Solutions of Hyperbolic Conservation Laws

Algebra für Einsteiger

Barsotti Symposium in Algebraic Geometry contains papers corresponding to the lectures given at the 1991 memorial meeting held in Abano Terme in honor of Iacopo Barsotti. This text reflects Barsotti's significant contributions in the field. This book is composed of 10 chapters and begins with a review of the centers of three-dimensional skyliner algebras. The succeeding chapters deal with the theoretical aspects of the Abelian varieties, Witt realization of p -Adic Barsotti-Tate Groups, and hypergeometric series and functions. These topics are followed by discussions of logarithmic spaces and the estimates for and inequalities among A -numbers. The closing chapter describes the moduli of Abelian varieties in positive characteristic. This book will be of value to mathematicians.

Contributions to Algebraic Geometry in Honor of Oscar Zariski

This book provides a systematic approach for the algorithmic formulation and implementation of

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mathematical operations in computer algebra programming languages. The viewpoint is that mathematical expressions, represented by expression trees, are the data objects of computer algebra programs, and by using a few primitive operations that analyze and

Algebraic Geometry and Commutative Algebra

Clearly presented discussions of fields, vector spaces, homogeneous linear equations, extension fields, polynomials, algebraic elements, as well as sections on solvable groups, permutation groups, solution of equations by radicals, and other concepts. 1966 edition.

Galois Theory

Basic Algebra and Advanced Algebra systematically develop concepts and tools in algebra that are vital to every mathematician, whether pure or applied, aspiring or established. Advanced Algebra includes chapters on modern algebra which treat various topics in commutative and noncommutative algebra and provide introductions to the theory of associative algebras, homological algebras, algebraic number theory, and algebraic geometry. Many examples and hundreds of problems are included, along with hints or complete solutions for most of the problems. Together the two books give the reader a global view of algebra and its role in mathematics as a whole.

Classical Galois Theory

Rich in examples and intuitive discussions, this book presents General Algebra using the unifying

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viewpoint of categories and functors. Starting with a survey, in non-category-theoretic terms, of many familiar and not-so-familiar constructions in algebra (plus two from topology for perspective), the reader is guided to an understanding and appreciation of the general concepts and tools unifying these constructions. Topics include: set theory, lattices, category theory, the formulation of universal constructions in category-theoretic terms, varieties of algebras, and adjunctions. A large number of exercises, from the routine to the challenging, interspersed through the text, develop the reader's grasp of the material, exhibit applications of the general theory to diverse areas of algebra, and in some cases point to outstanding open questions. Graduate students and researchers wishing to gain fluency in important mathematical constructions will welcome this carefully motivated book.

Algebra

ELEMENTS OF MODERN ALGEBRA, 7e, INTERNATIONAL EDITION with its user-friendly format, provides you with the tools you need to get succeed in abstract algebra and develop mathematical maturity as a bridge to higher-level mathematics courses.. Strategy boxes give you guidance and explanations about techniques and enable you to become more proficient at constructing proofs. A summary of key words and phrases at the end of each chapter help you master the material. A reference section, symbolic marginal notes, an appendix, and numerous examples help you develop your problem solving skills.

Multivariable Mathematics

Many students have trouble the first time they take a mathematics course in which proofs play a

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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.

Elements of Modern Algebra, International Edition

This text provides a thorough introduction to “modern” or “abstract” algebra at a level suitable for upper-level undergraduates and beginning graduate students. The book addresses the conventional topics: groups, rings, fields, and linear algebra, with symmetry as a unifying theme. This subject matter is central and ubiquitous in modern mathematics and in applications ranging from quantum physics to digital communications. The most important goal of this book is to engage students in the active practice of mathematics.

Basic Abstract Algebra

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This carefully written textbook offers a thorough introduction to abstract algebra, covering the fundamentals of groups, rings and fields. The first two chapters present preliminary topics such as properties of the integers and equivalence relations. The author then explores the first major algebraic structure, the group, progressing as far as the Sylow theorems and the classification of finite abelian groups. An introduction to ring theory follows, leading to a discussion of fields and polynomials that includes sections on splitting fields and the construction of finite fields. The final part contains applications to public key cryptography as well as classical straightedge and compass constructions. Explaining key topics at a gentle pace, this book is aimed at undergraduate students. It assumes no prior knowledge of the subject and contains over 500 exercises, half of which have detailed solutions provided.

The Classical Groups

Solutions of equations in integers is the central problem of number theory and is the focus of this book. The amount of material is suitable for a one-semester course. The author has tried to avoid the ad hoc proofs in favor of unifying ideas that work in many situations. There are exercises at the end of almost every section, so that each new idea or proof receives immediate reinforcement.

Algebra: Pearson New International Edition

This is a basic introduction to modern algebra, providing a solid understanding of the axiomatic treatment of groups and then rings, aiming to promote a feeling for the evolutionary and historical development of the subject. It includes problems and fully worked solutions, enabling readers to master

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the subject rather than simply observing it.

Abstract Algebra

For those looking for an introduction to the area of commutative algebra, this book opens all the right doors and provides a clarity of understanding that all will welcome.

Linear Algebra Done Right

Galois theory is considered one of the most beautiful subjects in mathematics, but it is hard to appreciate this fact fully without seeing specific examples. Numerous examples are therefore included throughout this text, in the hope that they will lead to a deeper understanding and genuine appreciation of the more abstract and advanced literature on Galois theory.

How to Prove It

This book provides a modern introduction to the representation theory of finite groups. Now in its second edition, the authors have revised the text and added much new material. The theory is developed in terms of modules, since this is appropriate for more advanced work, but considerable emphasis is placed upon constructing characters. Included here are the character tables of all groups of order less than 32, and all simple groups of order less than 1000. Applications covered include Burnside's $p^a q^b$ theorem, the use of character theory in studying subgroup structure and permutation groups, and how to use representation theory to investigate molecular vibration. Each chapter features

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a variety of exercises, with full solutions provided at the end of the book. This will be ideal as a course text in representation theory, and in view of the applications, will be of interest to chemists and physicists as well as mathematicians.

Algebra: Abstract and Concrete, edition 2.6

This book is the second part of the new edition of *Advanced Modern Algebra* (the first part published as *Graduate Studies in Mathematics, Volume 165*). Compared to the previous edition, the material has been significantly reorganized and many sections have been rewritten. The book presents many topics mentioned in the first part in greater depth and in more detail. The five chapters of the book are devoted to group theory, representation theory, homological algebra, categories, and commutative algebra, respectively. The book can be used as a text for a second abstract algebra graduate course, as a source of additional material to a first abstract algebra graduate course, or for self-study.

Groups, Rings and Fields

Algebra: Chapter 0 is a self-contained introduction to the main topics of algebra, suitable for a first sequence on the subject at the beginning graduate or upper undergraduate level. The primary distinguishing feature of the book, compared to standard textbooks in algebra, is the early introduction of categories, used as a unifying theme in the presentation of the main topics. A second feature consists of an emphasis on homological algebra: basic notions on complexes are presented as soon as modules have been introduced, and an extensive last chapter on homological algebra can form the basis for a follow-up introductory course on the subject. Approximately 1,000 exercises both provide

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adequate practice to consolidate the understanding of the main body of the text and offer the opportunity to explore many other topics, including applications to number theory and algebraic geometry. This will allow instructors to adapt the textbook to their specific choice of topics and provide the independent reader with a richer exposure to algebra. Many exercises include substantial hints, and navigation of the topics is facilitated by an extensive index and by hundreds of cross-references.

Linear Algebra Problem Book

Algebra, Second Edition, by Michael Artin, is ideal for the honors undergraduate or introductory graduate course. The second edition of this classic text incorporates twenty years of feedback and the author's own teaching experience. The text discusses concrete topics of algebra in greater detail than most texts, preparing students for the more abstract concepts; linear algebra is tightly integrated throughout.

Introduction to Linear Algebra

Algebraic Geometry and Commutative Algebra in Honor of Masayoshi Nagata presents a collection of papers on algebraic geometry and commutative algebra in honor of Masayoshi Nagata for his significant contributions to commutative algebra. Topics covered range from power series rings and rings of invariants of finite linear groups to the convolution algebra of distributions on totally disconnected locally compact groups. The discussion begins with a description of several formulas for enumerating certain types of objects, which may be tabular arrangements of integers called Young tableaux or some types of monomials. The next chapter explains how to establish these enumerative

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formulas, with emphasis on the role played by transformations of determinantal polynomials and recurrence relations satisfied by them. The book then turns to several applications of the enumerative formulas and universal identity, including including enumerative proofs of the straightening law of Doubilet-Rota-Stein and computations of Hilbert functions of polynomial ideals of certain determinantal loci. Invariant differentials and quaternion extensions are also examined, along with the moduli of Todorov surfaces and the classification problem of embedded lines in characteristic p . This monograph will be a useful resource for practitioners and researchers in algebra and geometry.

A History of Abstract Algebra

Undergraduate Commutative Algebra

This book provides a complete abstract algebra course, enabling instructors to select the topics for use in individual classes.

Galois Theory

Multivariable Mathematics combines linear algebra and multivariable mathematics in a rigorous approach. The material is integrated to emphasize the recurring theme of implicit versus explicit that persists in linear algebra and analysis. In the text, the author includes all of the standard computational material found in the usual linear algebra and multivariable calculus courses, and more, interweaving the material as effectively as possible, and also includes complete proofs. * Contains plenty of

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examples, clear proofs, and significant motivation for the crucial concepts. * Numerous exercises of varying levels of difficulty, both computational and more proof-oriented. * Exercises are arranged in order of increasing difficulty.

Introduction To Commutative Algebra

Finally a self-contained, one volume, graduate-level algebra text that is readable by the average graduate student and flexible enough to accommodate a wide variety of instructors and course contents. The guiding principle throughout is that the material should be presented as general as possible, consistent with good pedagogy. Therefore it stresses clarity rather than brevity and contains an extraordinarily large number of illustrative exercises.

Algebra: Chapter 0

A Book of Abstract Algebra

The companion title, Linear Algebra, has sold over 8,000 copies The writing style is very accessible The material can be covered easily in a one-year or one-term course Includes Noah Snyder's proof of the Mason-Stothers polynomial abc theorem New material included on product structure for matrices including descriptions of the conjugation representation of the diagonal group

Abstract Algebra

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Geometry provides a whole range of views on the universe, serving as the inspiration, technical toolkit and ultimate goal for many branches of mathematics and physics. This book introduces the ideas of geometry, and includes a generous supply of simple explanations and examples. The treatment emphasises coordinate systems and the coordinate changes that generate symmetries. The discussion moves from Euclidean to non-Euclidean geometries, including spherical and hyperbolic geometry, and then on to affine and projective linear geometries. Group theory is introduced to treat geometric symmetries, leading to the unification of geometry and group theory in the Erlangen program. An introduction to basic topology follows, with the Möbius strip, the Klein bottle and the surface with g handles exemplifying quotient topologies and the homeomorphism problem. Topology combines with group theory to yield the geometry of transformation groups, having applications to relativity theory and quantum mechanics. A final chapter features historical discussions and indications for further reading. With minimal prerequisites, the book provides a first glimpse of many research topics in modern algebra, geometry and theoretical physics. The book is based on many years' teaching experience, and is thoroughly class-tested. There are copious illustrations, and each chapter ends with a wide supply of exercises. Further teaching material is available for teachers via the web, including assignable problem sheets with solutions.

Computer Algebra and Symbolic Computation

This book explores the history of abstract algebra. It shows how abstract algebra has arisen in attempting to solve some of these classical problems, providing a context from which the reader may gain a deeper appreciation of the mathematics involved.

Advanced Modern Algebra: Third Edition, Part 2

Representations and Characters of Groups

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.

Geometry and Topology

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

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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.

Undergraduate Algebra

This is the eBook of the printed book and may not include any media, website access codes, or print supplements that may come packaged with the bound book. Algebra, Second Edition, by Michael Artin, provides comprehensive coverage at the level of an honors-undergraduate or introductory-graduate course. The second edition of this classic text incorporates twenty years of feedback plus the author's own teaching experience. This book discusses concrete topics of algebra in greater detail than others, preparing readers for the more abstract concepts; linear algebra is tightly integrated throughout.

Barsotti Symposium in Algebraic Geometry

Galois theory is the culmination of a centuries-long search for a solution to the classical problem of solving algebraic equations by radicals. In this book, Bewersdorff follows the historical development of the theory, emphasizing concrete examples along the way. As a result, many mathematical abstractions are now seen as the natural consequence of particular investigations. Few prerequisites are needed beyond general college mathematics, since the necessary ideas and properties of groups and fields are provided as needed. Results in Galois theory are formulated first in a concrete,

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elementary way, then in the modern form. Each chapter begins with a simple question that gives the reader an idea of the nature and difficulty of what lies ahead. The applications of the theory to geometric constructions, including the ancient problems of squaring the circle, duplicating the cube, and trisecting an angle, and the construction of regular n -gons are also presented. This book is suitable for undergraduates and beginning graduate students.

Abstract Algebra

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.

The Cauchy-Schwarz Master Class

First Published in 2018. Routledge is an imprint of Taylor & Francis, an Informa company.

Elements of Number Theory

This 2004 book presents a fascinating collection of problems related to the Cauchy-Schwarz inequality and coaches readers through solutions.

Advanced Algebra

In this renowned volume, Hermann Weyl discusses the symmetric, full linear, orthogonal, and symplectic groups and determines their different invariants and representations. Using basic concepts from algebra, he examines the various properties of the groups. Analysis and topology are used wherever appropriate. The book also covers topics such as matrix algebras, semigroups, commutators, and spinors, which are of great importance in understanding the group-theoretic structure of quantum mechanics. Hermann Weyl was among the greatest mathematicians of the twentieth century. He made fundamental contributions to most branches of mathematics, but he is best remembered as one of the major developers of group theory, a powerful formal method for analyzing abstract and physical systems in which symmetry is present. In *The Classical Groups*, his most important book, Weyl provided a detailed introduction to the development of group theory, and he did it in a way that motivated and entertained his readers. Departing from most theoretical mathematics books of the time, he introduced historical events and people as well as theorems and proofs. One learned not only about the theory of invariants but also when and where they were originated, and by whom. He once said of his writing, "My work always tried to unite the truth with the beautiful, but when I had to choose one or the other, I usually chose the beautiful." Weyl believed in the overall unity of mathematics and that it should be integrated into other fields. He had serious interest in modern physics, especially quantum mechanics, a field to which *The Classical Groups* has proved important, as it has to quantum chemistry and other fields. Among the five books Weyl published with Princeton, *Algebraic Theory of Numbers* inaugurated the *Annals of Mathematics Studies* book series, a crucial and enduring foundation of Princeton's mathematics list and the most distinguished book series in mathematics.

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Algebra

Accessible but rigorous, this outstanding text encompasses all of the topics covered by a typical course in elementary abstract algebra. Its easy-to-read treatment offers an intuitive approach, featuring informal discussions followed by thematically arranged exercises. This second edition features additional exercises to improve student familiarity with applications. 1990 edition.

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