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Extended Abstracts Spring 2019 - Berta Barquero 2021
The book presents research works developed within the Anthropological Theory of the Didactic (ATD) by senior and young researchers that participated in the Intensive Research Program Advances in the anthropological theory of the didactic and their consequences in curricula and teacher education held at the Centre de Recerca Matematica (CRM) in Barcelona. It is organized in three axes of current research on the ATD: teacher education and the professionalization of teaching; the curriculum problem in the historical transition from the classical paradigm of visiting works to the emerging didactic paradigm of questioning the world; and research in didactics at the university level.
Lie Algebras and Algebraic Groups - Patrice Tauvel 2006-03-30
Devoted to the theory of Lie algebras and algebraic groups, this book includes a large amount of commutative algebra and algebraic geometry so as to make it as self-contained as possible. The aim of the book is to assemble in a single volume the algebraic aspects of the theory, so as to present the foundations of the theory in characteristic zero. Detailed proofs are included, and some recent results are discussed in the final chapters.

(Mostly) Commutative Algebra - Antoine Chambert-Loir 2021-04-08
This book stems from lectures on commutative algebra for 4th-year university students at two French universities (Paris and Rennes). At that level, students have already followed a basic course in linear algebra and are essentially fluent with the language of vector spaces over fields. The topics introduced include arithmetic of rings, modules, especially principal ideal rings and the classification of modules over such rings, Galois theory, as well as an introduction to more advanced topics such as homological algebra, tensor products, and algebraic concepts involved in algebraic geometry. More than 300 exercises will allow the reader to deepen his understanding of the subject. The book also includes 11 historical vignettes about mathematicians who contributed to commutative algebra.
Algebra and Galois Theories - Régine Douady 2020-07-13
Galois theory has such close analogies with the theory of coverings that algebraists use a geometric language to speak of field extensions, while topologists speak of "Galois coverings". This book endeavors to develop these theories in a parallel way, starting with that of coverings, which better allows the reader to make images. The authors chose a plan that

emphasizes this parallelism. The intention is to allow to transfer to the algebraic framework of Galois theory the geometric intuition that one can have in the context of coverings. This book is aimed at graduate students and mathematicians curious about a non-exclusively algebraic view of Galois theory.

Abstract Algebra - John W. Lawrence 2021-04-15
Through this book, upper undergraduate mathematics majors will master a challenging yet rewarding subject, and approach advanced studies in algebra, number theory and geometry with confidence. Groups, rings and fields are covered in depth with a strong emphasis on irreducible polynomials, a fresh approach to modules and linear algebra, a fresh take on Gröbner theory, and a group theoretic treatment of Rejewski's deciphering of the Enigma machine. It includes a detailed treatment of the basics on finite groups, including Sylow theory and the structure of finite abelian groups. Galois theory and its applications to polynomial equations and geometric constructions are treated in depth. Those interested in computations will appreciate the novel treatment of division algorithms. This rigorous text 'gets to the point', focusing on concisely demonstrating the concept at hand, taking a 'definitions first, examples next' approach. Exercises reinforce the main ideas of the text and encourage students' creativity.

Fundamentals of Advanced Mathematics 1 - Henri Bourles 2017-07-10
This precis, comprised of three volumes, of which this book is the first, exposes the mathematical elements which make up the foundations of a number of contemporary scientific methods: modern theory on systems, physics and engineering. This first volume focuses primarily on algebraic questions: categories and functors, groups, rings, modules and algebra. Notions are introduced in a general framework and then studied in the context of commutative and homological algebra; their application in algebraic topology and geometry is therefore developed. These notions play an essential role in algebraic analysis (analytico-algebraic systems theory of ordinary or partial linear differential equations). The book concludes with a study of modules over the main types of rings, the

rational canonical form of matrices, the (commutative) theory of elemental divisors and their application in systems of linear differential equations with constant coefficients. Part of the New Mathematical Methods, Systems, and Applications series Presents the notions, results, and proofs necessary to understand and master the various topics Provides a unified notation, making the task easier for the reader. Includes several summaries of mathematics for engineers

Abstract Algebra - Pierre Antoine Grillet 2007-07-21
A completely reworked new edition of this superb textbook. This key work is geared to the needs of the graduate student. It covers, with proofs, the usual major branches of groups, rings, fields, and modules. Its inclusive approach means that all of the necessary areas are explored, while the level of detail is ideal for the intended readership. The text tries to promote the conceptual understanding of algebra as a whole, doing so with a masterful grasp of methodology. Despite the abstract subject matter, the author includes a careful selection of important examples, together with a detailed elaboration of the more sophisticated, abstract theories.

Non-Noetherian Commutative Ring Theory - S.T. Chapman 2013-03-09
Commutative Ring Theory emerged as a distinct field of research in mathematics only at the beginning of the twentieth century. It is rooted in nineteenth century major works in Number Theory and Algebraic Geometry for which it provided a useful tool for proving results. From this humble origin, it flourished into a field of study in its own right of an astonishing richness and interest. Nowadays, one has to specialize in an area of this vast field in order to be able to master its wealth of results and come up with worthwhile contributions. One of the major areas of the field of Commutative Ring Theory is the study of non-Noetherian rings. The last ten years have seen a lively flurry of activity in this area, including: a large number of conferences and special sections at national and international meetings dedicated to presenting its results, an abundance of articles in scientific journals, and a substantial number of books capturing some of its topics. This rapid growth, and the occasion of the new Millennium, prompted us to embark on a project aimed at

presenting an overview of the recent research in the area. With this in mind, we invited many of the most prominent researchers in Non-Noetherian Commutative Ring Theory to write expository articles representing the most recent topics of research in this area.

Algebraic Number Theory - 2011-01-05
Bringing the material up to date to reflect modern applications, Algebraic Number Theory, Second Edition has been completely rewritten and reorganized to incorporate a new style, methodology, and presentation. This edition focuses on integral domains, ideals, and unique factorization in the first chapter; field extensions in the second chapter; and

Multiplicative Ideal Theory in Commutative Algebra - James W. Brewer 2006-12-15
This volume, a tribute to the work of Robert Gilmer, consists of twenty-four articles authored by his most prominent students and followers. These articles combine surveys of past work by Gilmer and others, recent results which have never before seen print, open problems, and extensive bibliographies. The entire collection provides an in-depth overview of the topics of research in a significant and large area of commutative algebra.

Algebra - Siegfried Bosch 2018-11-02
The material presented here can be divided into two parts. The first, sometimes referred to as abstract algebra, is concerned with the general theory of algebraic objects such as groups, rings, and fields, hence, with topics that are also basic for a number of other domains in mathematics. The second centers around Galois theory and its applications. Historically, this theory originated from the problem of studying algebraic equations, a problem that, after various unsuccessful attempts to determine solution formulas in higher degrees, found its complete clarification through the brilliant ideas of E. Galois. The study of algebraic equations has served as a motivating terrain for a large part of abstract algebra, and according to this, algebraic equations are visible as a guiding thread throughout the book. To underline this point, an introduction to the history of algebraic equations is included. The entire book is self-contained, up to a few prerequisites from linear algebra. It covers most topics of current algebra courses and is enriched by several optional sections that complement the standard program or, in some cases, provide a first view on nearby areas that are more advanced. Every chapter begins with an introductory section on "Background and Overview," motivating the material that follows and discussing its highlights on an informal level. Furthermore, each section ends with a list of specially adapted exercises, some of them with solution proposals in the appendix. The present English edition is a translation and critical revision of the eighth German edition of the Algebra book by the author. The book appeared for the first time in 1993 and, in later years, was complemented by adding a variety of related topics. At the same time it was modified and polished to keep its contents up to date.

Error-Free Polynomial Matrix Computations - E.V. Krishnamurthy 2012-12-06
This book is written as an introduction to polynomial matrix computations. It is a companion volume to an earlier book on Methods and Applications of Error-Free Computation by R. T. Gregory and myself, published by Springer-Verlag, New York, 1984. This book is intended for seniors and graduate students in computer and system sciences, and mathematics, and for researchers in the fields of computer science, numerical analysis, systems theory, and computer algebra. Chapter I introduces the basic concepts of abstract algebra, including power series and polynomials. This chapter is essentially meant for bridging the gap between the abstract algebra and polynomial matrix computations. Chapter II is concerned with the evaluation and interpolation of polynomials. The use of these techniques for exact inversion of poly nomial matrices is explained in the light of currently available error-free computation methods. In Chapter III, the principles and practice of Fourier evaluation and interpolation are described. In particular, the application of error-free discrete Fourier transforms for polynomial matrix computations is consi dered.

A Course in Abstract Algebra, 5th Edition - Khanna V.K. & Bhamri S.K 2016

Designed for undergraduate and postgraduate students of mathematics, the book can also be used by those preparing for various competitive examinations. The text starts with a brief introduction to results from Set theory and Number theory. It then goes on to cover Groups, Rings, Fields and Linear Algebra. The topics under groups include subgroups, finitely generated abelian groups, group actions, solvable and nilpotent groups. The course in ring theory covers ideals, embedding of rings, Euclidean domains, PIDs, UFDs, polynomial rings, Noetherian (Artinian) rings. Topics of field include algebraic extensions, splitting fields, normal extensions, separable extensions, algebraically closed fields, Galois extensions, and construction by ruler and compass. The portion on linear algebra deals with vector spaces, linear transformations, Eigen spaces, diagonalizable operators, inner product spaces, dual spaces, operators on inner product spaces etc. The theory has been strongly supported by numerous examples and worked-out problems. There is also plenty of scope for the readers to try and solve problems on their own.New in this Edition• A full section on operators in inner product spaces.• Complete survey of finite groups of order up to 15 and Wedderburn theorem on finite division rings.• Addition of around one hundred new worked-out problems and examples.• Alternate and simpler proofs of some results.• A new section on quick recall of various useful results at the end of the book to facilitate the reader to get instant answers to tricky questions.

Algorithms for Computer Algebra - Keith O. Geddes 2007-06-30
Algorithms for Computer Algebra is the first comprehensive textbook to be published on the topic of computational symbolic mathematics. The book first develops the foundational material from modern algebra that is required for subsequent topics. It then presents a thorough development of modern computational algorithms for such problems as multivariate polynomial arithmetic and greatest common divisor calculations, factorization of multivariate polynomials, symbolic solution of linear and polynomial systems of equations, and analytic integration of elementary functions. Numerous examples are integrated into the text as an aid to understanding the mathematical development. The algorithms developed for each topic are presented in a Pascal-like computer language. An extensive set of exercises is presented at the end of each chapter. Algorithms for Computer Algebra is suitable for use as a textbook for a course on algebraic algorithms at the third-year, fourth-year, or graduate level. Although the mathematical development uses concepts from modern algebra, the book is self-contained in the sense that a one-term undergraduate course introducing students to rings and fields is the only prerequisite assumed. The book also serves well as a supplementary textbook for a traditional modern algebra course, by presenting concrete applications to motivate the understanding of the theory of rings and fields.

Gröbner Bases - Thomas Becker 2012-12-06
The origins of the mathematics in this book date back more than two thou sand years, as can be seen from the fact that one of the most important algorithms presented here bears the name of the Greek mathematician Eu clid. The word "algorithm" as well as the key word "algebra" in the title of this book come from the name and the work of the ninth-century scientist Mohammed ibn Musa al-Khowarizmi, who was born in what is now Uzbek istan and worked in Baghdad at the court of Harun al-Rashid's son. The word "algorithm" is actually a westernization of al-Khowarizmi's name, while "algebra" derives from "al-jabr," a term that appears in the title of his book Kitab al-jabr wa'l muqabala, where he discusses symbolic methods for the solution of equations. This close connection between algebra and al gorithms lasted roughly up to the beginning of this century; until then, the primary goal of algebra was the design of constructive methods for solving equations by means of symbolic transformations. During the second half of the nineteenth century, a new line of thought began to enter algebra from the realm of geometry, where it had been successful since Euclid's time, namely, the axiomatic method.

Algebra II - N. Bourbaki 2013-12-01
This is a softcover reprint of chapters four through seven of the 1990 English translation of the revised and expanded version of Bourbaki's Algebre. Much material was added or revised for this edition, which thoroughly establishes the theories of commutative fields and modules

over a principal ideal domain.

Number Theory and Discrete Mathematics - Ashok K. Agarwal 2002
This volume contains the proceedings of this conference and collects 29 articles written by some of the leading specialists worldwide. Most of the papers describe recent trends and problems--their current status, as well as historical backgrounds. (Midwest).

Canadian Journal of Mathematics - 1982-02

Zero-Dimensional Commutative Rings - David F. Anderson 1995-04-10
This work presents advances in zero-dimensional commutative rings and commutative algebra. It illustrates the research frontier with 52 open problems together with comments on the relevant literature, and offers a comprehensive index for easy access to information. Wide-ranging developments in commutative ring theory are examined.

Advanced Information Systems Engineering - Klaus R. Dittrich 2003-05-15
Since the late 1980s, the CAiSE conferences have provided a forum for the p- sentation and exchange of research results and practical experiences within the ?eld of Information Systems Engineering. CAiSE 2001 was the 13th conference in this series and was held from 4th to 8th June 2001 in the resort of Int- laken located near the three famous Swiss mountains – the Eiger, Mˆonch, and Jungfrau. The ?rst two days consisted of pre-conference workshops and tutorials. The workshop themes included requirements engineering, evaluation of modeling methods, data integration over the Web, agent-oriented information systems, and the design and management of data warehouses. Continuing the tradition of recent CAiSE conferences, there was also a doctoral consortium. The p- conference tutorials were on the themes of e-business models and XML appli- tion development. The main conference program included three invited speakers, two tuto- als, and a panel discussion in addition to presentations of the papers in these proceedings. We also included a special 'practice and experience' session to give

presentersanopportunitytoreportonanddiscussexperiencesandinvestigati ons on the use of methods and technologies in practice. Weextendourthankstothemembersoftheprogramcommitteeandallother referees without whom such conferences would not be possible. The program committee, whose members came from 20 di?erent countries, selected 27 hi- quality research papers and 3 experience reports from a total of 97 submissions. The topics of these papers span the wide-range of topics relevant to information systems engineering – from requirements and design through to implementation and operation of complex and dynamic systems.

Topics In Abstract Algebra (second Edition) - P. Mukhopadhyay 2006
This book covers the elements of Abstract Algebra, which is a major mathematics course for undergraduate students all over the country and also for first year postgraduate students of many universities. It is designed according to the new UGC syllabus prescribed for all Indian universities.

Simple Extensions with the Minimum Degree Relations of Integral Domains - Susumu Oda 2007-03-05
Although there are many types of ring extensions, simple extensions have yet to be thoroughly explored in one book. Covering an understudied aspect of commutative algebra, Simple Extensions with the Minimum Degree Relations of Integral Domains presents a comprehensive treatment of various simple extensions and their properties. In particular, it examines several properties of simple ring extensions of Noetherian integral domains. As experts who have been studying this field for over a decade, the authors present many arguments that they have developed themselves, mainly exploring anti-integral, super-primitive, and ultra-primitive extensions. Within this framework, they study certain properties, such as flatness, integrality, and unramifiedness. Some of the topics discussed include Sharma polynomials, vanishing points, Noetherian domains, denominator ideals, unit groups, and polynomial rings. Presenting a complete treatment of each topic, Simple Extensions with the Minimum Degree Relations of

Integral Domains serves as an ideal resource for graduate students and researchers involved in the area of commutative algebra.

Trends in Commutative Rings Research - Ayman Badawi 2004
Trends in Commutative Rings Research

The New Encyclopaedia Britannica - 1974

Algebra and Number Theory - Martyn R. Dixon 2011-07-15
Explore the main algebraic structures and number systems that play a central role across the field of mathematics Algebra and number theory are two powerful branches of modern mathematics at the forefront of current mathematical research, and each plays an increasingly significant role in different branches of mathematics, from geometry and topology to computing and communications. Based on the authors' extensive experience within the field, Algebra and Number Theory has an innovative approach that integrates three disciplines—linear algebra, abstract algebra, and number theory—into one comprehensive and fluid presentation, facilitating a deeper understanding of the topic and improving readers' retention of the main concepts. The book begins with an introduction to the elements of set theory. Next, the authors discuss matrices, determinants, and elements of field theory, including preliminary information related to integers and complex numbers. Subsequent chapters explore key ideas relating to linear algebra such as vector spaces, linear mapping, and bilinear forms. The book explores the development of the main ideas of algebraic structures and concludes with applications of algebraic ideas to number theory. Interesting applications are provided throughout to demonstrate the relevance of the discussed concepts. In addition, chapter exercises allow readers to test their comprehension of the presented material. Algebra and Number Theory is an excellent book for courses on linear algebra, abstract algebra, and number theory at the upper-undergraduate level. It is also a valuable reference for researchers working in different fields of mathematics, computer science, and engineering as well as for individuals preparing for a career in mathematics education.
New Developments in Computer Science Research - Susan Shannon

2005
Presents leading-edge research in the field of computer research, technology and applications. Each contribution has been carefully selected for inclusion based on the significance of the research to the field. The summaries of all chapters are gathered at the beginning of this book, and an in-depth index is presented to facilitate access.
Advanced Number Theory with Applications - Richard A. Mollin 2009-08-26
Exploring one of the most dynamic areas of mathematics, Advanced Number Theory with Applications covers a wide range of algebraic, analytic, combinatorial, cryptographic, and geometric aspects of number theory. Written by a recognized leader in algebra and number theory, the book includes a page reference for every citing in the bibliography and mo
Algebra: Abstract and Modern - Swamy and Murthy
Algebra: Abstract and Modern, introduces the reader to the preliminaries of algebra and then explains topics like group theory and field theory in depth. It also features a blend of numerous challenging exercises and examples that further enhance e
The New Encyclop©Œdia Britannica - 1983

Commutative Algebra and its Applications - Marco Fontana 2009-09-04

Algebra - Larry C. Grove 2012-06-22
This graduate-level text is intended for initial courses in algebra that proceed at a faster pace than undergraduate-level courses. Subjects include groups, rings, fields, and Galois theory. 1983 edition. Includes 11 figures. Appendix. References. Index.
Algebra 1 - Ramji Lal 2017-05-07
This is the first in a series of three volumes dealing with important topics in algebra. It offers an introduction to the foundations of mathematics together with the fundamental algebraic structures, namely groups, rings, fields, and arithmetic. Intended as a text for undergraduate and

graduate students of mathematics, it discusses all major topics in algebra with numerous motivating illustrations and exercises to enable readers to acquire a good understanding of the basic algebraic structures, which they can then use to find the exact or the most realistic solutions to their problems.

Basic Modern Algebra with Applications - Mahima Ranjan Adhikari 2013-12-08
The book is primarily intended as a textbook on modern algebra for undergraduate mathematics students. It is also useful for those who are interested in supplementary reading at a higher level. The text is designed in such a way that it encourages independent thinking and motivates students towards further study. The book covers all major topics in group, ring, vector space and module theory that are usually contained in a standard modern algebra text. In addition, it studies semigroup, group action, Hopf's group, topological groups and Lie groups with their actions, applications of ring theory to algebraic geometry, and defines Zariski topology, as well as applications of module theory to structure theory of rings and homological algebra. Algebraic aspects of classical number theory and algebraic number theory are also discussed with an eye to developing modern cryptography. Topics on applications to algebraic topology, category theory, algebraic geometry, algebraic number theory, cryptography and theoretical computer science interlink the subject with different areas. Each chapter discusses individual topics, starting from the basics, with the help of illustrative examples. This comprehensive text with a broad variety of concepts, applications, examples, exercises and historical notes represents a valuable and unique resource.

Integral Domains Inside Noetherian Power Series Rings: Constructions and Examples - William Heinzer 2021-10-08
Power series provide a technique for constructing examples of commutative rings. In this book, the authors describe this technique and use it to analyse properties of commutative rings and their spectra. This book presents results obtained using this approach. The authors put these results in perspective; often the proofs of properties of classical examples are simplified. The book will serve as a helpful resource for researchers working in commutative algebra.

Advances in Commutative Algebra - Ayman Badawi 2019-04-11
This book highlights the contributions of the eminent mathematician and leading algebraist David F. Anderson in wide-ranging areas of commutative algebra. It provides a balance of topics for experts and non-experts, with a mix of survey papers to offer a synopsis of developments across a range of areas of commutative algebra and outlining Anderson's work. The book is divided into two sections—surveys and recent research developments—with each section presenting material from all the major areas in commutative algebra. The book is of interest to graduate students and experienced researchers alike.

Introduction to Abstract Algebra - W. Keith Nicholson 2012-03-20
Praise for the Third Edition ". . . an expository masterpiece of the highest didactic value that has gained additional attractivity through the various improvements . . ."—Zentralblatt MATH The Fourth Edition of Introduction to Abstract Algebra continues to provide an accessible approach to the basic structures of abstract algebra: groups, rings, and fields. The book's unique presentation helps readers advance to abstract theory by presenting concrete examples of induction, number theory, integers modulo n, and permutations before the abstract structures are defined. Readers can immediately begin to perform computations using abstract concepts that are developed in greater detail later in the text. The Fourth Edition features important concepts as well as specialized topics, including: The treatment of nilpotent groups, including the Frattini and Fitting subgroups Symmetric polynomials The proof of the fundamental theorem of algebra using symmetric polynomials The proof of Wedderburn's theorem on finite division rings The proof of the Wedderburn-Artin theorem Throughout the book, worked examples and real-world problems illustrate concepts and their applications, facilitating a complete understanding for readers regardless of their background in mathematics. A wealth of computational and theoretical exercises, ranging from basic to complex, allows readers to test their comprehension of the material. In addition, detailed historical notes and

biographies of mathematicians provide context for and illuminate the discussion of key topics. A solutions manual is also available for readers who would like access to partial solutions to the book's exercises. Introduction to Abstract Algebra, Fourth Edition is an excellent book for courses on the topic at the upper-undergraduate and beginning-graduate levels. The book also serves as a valuable reference and self-study tool for practitioners in the fields of engineering, computer science, and applied mathematics.

Factorization in Integral Domains - Daniel Anderson 2017-11-13
The contents in this work are taken from both the University of Iowa's Conference on Factorization in Integral Domains, and the 909th Meeting of the American Mathematical Society's Special Session in Commutative Ring Theory held in Iowa City. The text gathers current work on factorization in integral domains and monoids, and the theory of divisibility, emphasizing possible different lengths of factorization into irreducible elements.

Certain Number-Theoretic Episodes In Algebra - Sivaramakrishnan R 2006-09-22
Many basic ideas of algebra and number theory intertwine, making it ideal to explore both at the same time. Certain Number-Theoretic Episodes in Algebra focuses on some important aspects of interconnections between number theory and commutative algebra.

Using a pedagogical approach, the author presents the conceptual foundations of commutati
Canadian Journal of Mathematics - 1986-03

Feynman Integrals - Stefan Weinzierl 2022-07-13
This textbook on Feynman integrals starts from the basics, requiring only knowledge of special relativity and undergraduate mathematics. Feynman integrals are indispensable for precision calculations in quantum field theory. At the same time, they are also fascinating from a mathematical point of view. Topics from quantum field theory and advanced mathematics are introduced as needed. The book covers modern developments in the field of Feynman integrals. Topics included are: representations of Feynman integrals, integration-by-parts, differential equations, intersection theory, multiple polylogarithms, Gelfand-Kapranov-Zelevinsky systems, coactions and symbols, cluster algebras, elliptic Feynman integrals, and motives associated with Feynman integrals. This volume is aimed at a) students at the master's level in physics or mathematics, b) physicists who want to learn how to calculate Feynman integrals (for whom state-of-the-art techniques and computations are provided), and c) mathematicians who are interested in the mathematical aspects underlying Feynman integrals. It is, indeed, the interwoven nature of their physical and mathematical aspects that make Feynman integrals so enthralling.