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 Cox Rings
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SHERLYN BRYSON

An Introduction to Groups, Rings and Fields CRC Press

"This book [provides] a basic but rigorous introduction to abstract algebra." --

Foundations of Module and Ring Theory CRC Press

This book is an undergraduate textbook on abstract algebra, beginning with the theories of rings and groups. As this is the first really abstract material students need, the pace here is gentle, and the basic concepts of subring, homomorphism, ideal, etc are developed in detail. Later, as students gain confidence with abstractions, they are led to further developments in group and ring theory (simple groups and extensions, Noetherian rings, and outline of universal algebra, lattices and categories) and to applications such as Galois theory and coding theory. There is also a chapter outlining the construction of the number systems from scratch and proving in three

different ways that transcendental numbers exist.

Abstract Algebra Springer Science & Business Media

This is a concise 2000 introduction at graduate level to ring theory, module theory and number theory.

The Book of Five Rings Courier Dover Publications

Using the proof of the non-trisectability of an arbitrary angle as a final goal, the author develops in an easy conversational style the basics of rings, fields, and vector spaces. Originally developed as a text for an introduction to algebra course for future high-school teachers at California State University, Northridge, the focus of this book is on exposition. It would serve extremely well as a focused, one-semester introduction to abstract algebra.

Rings, Fields, and Groups Springer Science & Business Media

to Group Rings by Cesar Polcino Milies Instituto de Matematica e Estatistica, Universidade de sao Paulo, sao Paulo, Brasil and Sudarshan K. Sehgal Department of Mathematical and Statistical Sciences, University of Alberta, Edmonton. Canada SPRINGER-SCIENCE+BUSINESS MEDIA, B.V. A

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owner. Contents Preface ix 1 Groups 1 1.1 Basic Concepts 1 1.2 Homomorphisms

and Factor Groups 10 1.3 Abelian Groups . 18 1.4 Group Actions, p-groups and Sylow Subgroups 21

1.5 Solvable and Nilpotent Groups 27 1.6 FC Groups .

Rings and Categories of Modules Springer

This book is intended to provide a reasonably self-contained account of a major portion of the

general theory of rings and modules suitable as a text for introductory and more advanced

graduate courses. We assume the familiarity with rings usually acquired in standard

undergraduate algebra courses. Our general approach is categorical rather than arithmetical. The continuing theme of the text is the study of the relationship between the one-sided ideal structure that a ring may possess and the behavior of its categories of modules. Following a brief outline of set-theoretic and categorical foundations, the text begins with the basic definitions and properties of rings, modules and homomorphisms and ranges through comprehensive treatments of direct sums, finiteness conditions, the Wedderburn-Artin Theorem, the Jacobson radical, the hom and tensor functions, Morita equivalence and duality, the composition theory of injective and projective modules, and semi perfect and perfect rings. In this second edition we have included a chapter containing many of the classical results on artinian rings that have helped to form the foundation for much of the contemporary research on the representation theory of artinian rings and finite dimensional algebras. Both to illustrate the text and to extend it we have included a substantial number of exercises covering a wide spectrum of difficulty. There are, of course, many important areas of ring and module theory that the text does not touch upon.

Abstract Algebra Cambridge University Press

This book is a self-contained elementary introduction to rings and modules, and should be useful for courses on Algebra. The emphasis is on concept development with adequate examples and counter-examples drawn from topics such as analysis, topology, etc. The entire material, including exercises, is fully class tested.

An Introduction to Methods of Ring Theory World Scientific Publishing Company

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.

Rings, Fields, and Vector Spaces John Wiley & Sons

This new book can be read independently from the first volume and may be used for lecturing, seminar- and self-study, or for general reference. It focuses more on specific topics in order to introduce readers to a wealth of basic and useful ideas without the hindrance of heavy machinery or undue abstractions. User-friendly with its abundance of examples illustrating the theory at virtually every step, the volume contains a large number of carefully chosen exercises to provide newcomers with practice, while offering a rich additional source of information to experts. A direct approach is used in order to present the material in an efficient and economic way, thereby introducing readers to a considerable amount of interesting ring theory without being dragged through endless preparatory material.

An Introduction to Abstract Algebra Springer

The book provides an introduction to modern abstract algebra and its applications. It covers all major topics of classical theory of numbers, groups, rings, fields and finite dimensional algebras. The book also provides interesting and important modern applications in such subjects as Cryptography, Coding Theory, Computer Science and Physics. In particular, it considers algorithm RSA, secret sharing algorithms, Diffie-Hellman Scheme and ElGamal cryptosystem based on discrete logarithm problem. It also presents Buchberger's algorithm which is one of the important algorithms for constructing Gröbner basis. Key Features: Covers all major topics of classical theory of modern abstract algebra such as groups, rings and fields and their applications. In addition it provides the introduction to the number theory, theory of finite fields, finite dimensional algebras and their applications. Provides interesting and important modern applications in such subjects as Cryptography, Coding Theory, Computer Science and Physics. Presents numerous examples illustrating the theory and applications. It is also filled with a number of exercises of various difficulty. Describes in detail the construction of the Cayley-Dickson construction for finite

dimensional algebras, in particular, algebras of quaternions and octonions and gives their applications in the number theory and computer graphics.

Air Defenses of the United States Army 1950-1979 : an Introductory History and Site Guide CRC Press

This book constitutes an elementary introduction to rings and fields, in particular Galois rings and Galois fields, with regard to their application to the theory of quantum information, a field at the crossroads of quantum physics, discrete mathematics and informatics. The existing literature on rings and fields is primarily mathematical. There are a great number of excellent books on the theory of rings and fields written by and for mathematicians, but these can be difficult for physicists and chemists to access. This book offers an introduction to rings and fields with numerous examples. It contains an application to the construction of mutually unbiased bases of pivotal importance in quantum information. It is intended for graduate and undergraduate students and researchers in physics, mathematical physics and quantum chemistry (especially in the domains of advanced quantum mechanics, quantum optics, quantum information theory, classical and quantum computing, and computer engineering). Although the book is not written for mathematicians, given the large number of examples discussed, it may also be of interest to undergraduate students in mathematics. Contains numerous examples that accompany the text Includes an important chapter on mutually unbiased bases Helps physicists and theoretical chemists understand this area of mathematics

Rings of Quotients Springer Science & Business Media

This second edition covers essentially the same topics as the first. However, the presentation of the material has been extensively revised and improved. In addition, there are two new chapters, one dealing with the fundamental theorem of finitely generated abelian groups and the other a brief introduction to semigroup theory and automata. This book is appropriate for second to fourth year undergraduates. In addition to the material traditionally taught at this level, the book contains several applications: Polya-Burnside Enumeration, Mutually Orthogonal Latin Squares, Error-Correcting Codes, and a classification of the finite groups of isometries of the plane and the finite rotation groups in Euclidean 3-space, semigroups and automata. It is hoped that these applications will help the reader achieve a better grasp of the rather abstract ideas presented and convince him/her that pure mathematics, in addition to having an austere beauty of its own, can be applied to solving practical problems. Considerable emphasis is placed on the algebraic system consisting of the congruence classes mod n under the usual operations of addition and multiplication. The reader is thus introduced — via congruence classes — to the idea of cosets and factor groups. This enables the transition to cosets and factor objects to be relatively painless. In this book, cosets, factor objects and homomorphisms are introduced early on so that the reader has at his/her disposal the tools required to give elegant proofs of the fundamental theorems. Moreover, homomorphisms play such a prominent role in algebra that they are used in this text wherever possible.

An Introduction to Abstract Algebra via Geometric Constructibility Springer Science & Business Media

This book provides a stimulating and unusual introduction to the results, methods and ideas which are now commonly studied in abstract algebra courses in universities and polytechnics. The mixture of informal and formal presentation generates the enthusiasm of the reader without neglecting the axiomatic approach necessary for the serious study.

An Introductory Course Springer Science & Business Media

This text presents the concepts of higher algebra in a comprehensive and modern way for self-study and as a basis for a high-level undergraduate course. The author is one of the preeminent researchers in this field and brings the reader up to the recent frontiers of research including never-before-published material. From the table of contents: - Groups: Monoids and Groups - Cauchy's Theorem - Normal Subgroups - Classifying Groups - Finite Abelian Groups - Generators and Relations - When Is a Group a Group? (Cayley's Theorem) - Sylow Subgroups - Solvable Groups - Rings and Polynomials: An Introduction to Rings - The Structure Theory of Rings - The Field of Fractions - Polynomials and Euclidean Domains - Principal Ideal Domains - Famous Results from

Number Theory - I Fields: Field Extensions - Finite Fields - The Galois Correspondence - Applications of the Galois Correspondence - Solving Equations by Radicals - Transcendental Numbers: e and p - Skew Field Theory - Each chapter includes a set of exercises

Groups, Rings, and Fields JHU Press

This book provides a largely self-contained introduction to Cox rings and their applications in algebraic and arithmetic geometry.

Algebra New Directions Publishing

The theory of rings of quotients has its origin in the work of (j). Ore and K. Asano on the construction of the total ring of fractions, in the 1930's and 40's. But the subject did not really develop until the end of the 1950's, when a number of important papers appeared (by R. E. Johnson, Y. Utumi, A. W. Goldie, P. Gabriel, J. Lambek, and others). Since then the progress has been rapid, and the subject has by now attained a stage of maturity, where it is possible to make a systematic account of it (which is the purpose of this book). The most immediate example of a ring of quotients is the field of fractions Q of a commutative integral domain A . It may be characterized by the two properties: (i) For every $q \in Q$ there exists a non-zero $s \in A$ such that $qs \in A$. (ii) Q is the maximal over-ring of A satisfying condition (i). The well-known construction of Q can be immediately extended to the case when A is an arbitrary commutative ring and S is a multiplicatively closed set of non-zero-divisors of A . In that case one defines the ring of fractions $Q = A[S^{-1}]$ as consisting of pairs (a, s) with $a \in A$ and $s \in S$, with the declaration that $(a, s) = (b, t)$ if there exists $u \in S$ such that $uta = usb$. The resulting ring Q satisfies (i), with the extra requirement that SES , and (ii).

Introduction to Groups, Rings and Fields with Applications Second Edition Springer Science & Business Media

Suitable for second to fourth year undergraduates, this title contains several applications: Polya-Burnside Enumeration, Mutually Orthogonal Latin Squares, Error-Correcting Codes and a classification of the finite groups of isometries of the plane and the finite rotation groups in Euclidean 3-space.

Abstract Algebra Butterworth-Heinemann

Tree-ring dating, or dendrochronology, is the study of the chronological sequence of annual growth rings in trees. This book--a seminal study in its field--provides a simple yet eloquent introduction to the discipline, explaining what a dendrochronologist does both in the field and in the laboratory. Authors Stokes and Smiley first explain the basic principles of tree-ring dating, then describe details of the process, step by step, from the time a sample is collected until it is incorporated into a master chronology. The book focuses on coniferous evergreens of the Southwest, particularly pi-ons, because they have wide geographic distribution, constitute a large population, and show excellent growth response to certain controlling factors. The book is specifically concerned with the task of establishing a calendar date for a wood or charcoal specimen. This concise but thorough explication of an important discipline will make dendrochronology more meaningful to students and professionals in archaeology, forestry, hydrology, and global change.

Cox Rings Cambridge University Press

This volume offers a compendium of exercises of varying degree of difficulty in the theory of modules and rings. It is the companion volume to GTM 189. All exercises are solved in full detail. Each section begins with an introduction giving the general background and the theoretical basis for the problems that follow.

Abstract Algebra Springer Science & Business Media

This textbook will help bring about the day when abstract algebra no longer creates intense anxiety but instead challenges students to fully grasp the meaning and power of the approach. Topics covered include: Rings; Integral domains; The fundamental theorem of arithmetic; Fields; Groups; Lagrange's theorem; Isomorphism theorems for groups; Fundamental theorem of finite abelian groups; The simplicity of A_n for $n \geq 5$; Sylow theorems; The Jordan-Hölder theorem; Ring isomorphism theorems; Euclidean domains; Principal ideal domains; The fundamental theorem of algebra; Vector spaces; Algebras; Field extensions: algebraic and transcendental; The fundamental theorem of Galois theory; The insolubility of the quintic

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