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Modern Analysis of Automorphic Forms By Example Paul Garrett 2018-08-31 Volume 1 of a two-volume introduction to the analytical aspects of automorphic forms, featuring proofs of critical results with examples.

Representations of Groups Klaus Lux 2010-07-01 The representation theory of finite groups has seen rapid growth in recent years with the development of efficient algorithms and computer algebra systems. This is the first book to provide an introduction to the ordinary and modular representation theory of finite groups with special emphasis on the computational aspects of the subject. Evolving from courses taught at Aachen University, this well-paced text is ideal for graduate-level study. The authors provide over 200 exercises, both theoretical and computational, and include worked examples using the computer algebra system GAP. These make the abstract theory tangible and engage students in real hands-on work. GAP is freely available from www.gap-system.org and readers can download source code and solutions to selected exercises from the book's web page.

Dimension Groups and Dynamical Systems Fabien Durand 2022-01-31 This book is the first self-

contained exposition of the fascinating link between dynamical systems and dimension groups. The authors explore the rich interplay between topological properties of dynamical systems and the algebraic structures associated with them, with an emphasis on symbolic systems, particularly substitution systems. It is recommended for anybody with an interest in topological and symbolic dynamics, automata theory or combinatorics on words. Intended to serve as an introduction for graduate students and other newcomers to the field as well as a reference for established researchers, the book includes a thorough account of the background notions as well as detailed exposition – with full proofs – of the major results of the subject. A wealth of examples and exercises, with solutions, serve to build intuition, while the many open problems collected at the end provide jumping-off points for future research.

Representation Theory of Finite Groups: a Guidebook David A. Craven 2019-08-30 This book provides an accessible introduction to the state of the art of representation theory of finite groups. Starting from a basic level that is summarized at the start, the book proceeds to cover topics of current research interest, including open problems and conjectures. The central themes of the book are block theory and module theory of group representations, which are comprehensively surveyed with a full bibliography. The individual chapters cover a range of topics within the subject, from blocks with cyclic defect groups to representations of symmetric groups. Assuming only modest background knowledge at the level of a first graduate course in algebra, this guidebook, intended for students taking first steps in the field, will also provide a reference for more experienced researchers. Although no proofs are included, end-of-chapter exercises make it suitable for student seminars.

Fourier Restriction, Decoupling, and Applications Ciprian Demeter 2020-01-02 The last fifteen years have seen a flurry of exciting developments in Fourier restriction theory, leading to significant new applications in diverse fields. This timely text brings the reader from the classical results to state-of-the-art advances in multilinear restriction theory, the Bourgain–Guth induction on scales and the polynomial method. Also discussed in the second part are decoupling for curved manifolds and a wide variety of applications in geometric analysis, PDEs (Strichartz estimates on tori, local smoothing for the wave equation) and number theory (exponential sum estimates and the proof of the Main Conjecture for Vinogradov's Mean Value Theorem). More than 100 exercises in the text help reinforce these important but often difficult

ideas, making it suitable for graduate students as well as specialists. Written by an author at the forefront of the modern theory, this book will be of interest to everybody working in harmonic analysis.

Geometry and Complexity Theory J. M. Landsberg 2017-09-28 Two central problems in computer science are P vs NP and the complexity of matrix multiplication. The first is also a leading candidate for the greatest unsolved problem in mathematics. The second is of enormous practical and theoretical importance. Algebraic geometry and representation theory provide fertile ground for advancing work on these problems and others in complexity. This introduction to algebraic complexity theory for graduate students and researchers in computer science and mathematics features concrete examples that demonstrate the application of geometric techniques to real world problems. Written by a noted expert in the field, it offers numerous open questions to motivate future research. Complexity theory has rejuvenated classical geometric questions and brought different areas of mathematics together in new ways. This book will show the beautiful, interesting, and important questions that have arisen as a result.

The Representation Theory of the Symmetric Group Gordon Douglas James 1984-12-28 The Representation Theory of the Symmetric Group provides an account of both the ordinary and modular representation theory of the symmetric groups. The range of applications of this theory is vast, varying from theoretical physics, through combinatories to the study of polynomial identity algebras; and new uses are still being found.

Mathematical Reviews 2008

Hardy Spaces Nikolaï Nikolski 2019-01-31 Graduate text covering the theory of Hardy spaces from its origins to the present, with concrete applications and solved exercises.

p–adic Differential Equations Kiran S. Kedlaya 2022-06-09 Now in its second edition, this volume provides a uniquely detailed study of P-adic differential equations. Assuming only a graduate-level background in number theory, the text builds the theory from first principles all the way to the frontiers of current research, highlighting analogies and links with the classical theory of ordinary differential equations. The

author includes many original results which play a key role in the study of P-adic geometry, crystalline cohomology, P-adic Hodge theory, perfectoid spaces, and algorithms for L-functions of arithmetic varieties. This updated edition contains five new chapters, which revisit the theory of convergence of solutions of P-adic differential equations from a more global viewpoint, introducing the Berkovich analytification of the projective line, defining convergence polygons as functions on the projective line, and deriving a global index theorem in terms of the Laplacian of the convergence polygon.

A Comprehensive Introduction to Sub-Riemannian Geometry Andrei Agrachev 2019-10-31 Sub-Riemannian geometry is the geometry of a world with nonholonomic constraints. In such a world, one can move, send and receive information only in certain admissible directions but eventually can reach every position from any other. In the last two decades sub-Riemannian geometry has emerged as an independent research domain impacting on several areas of pure and applied mathematics, with applications to many areas such as quantum control, Hamiltonian dynamics, robotics and Lie theory. This comprehensive introduction proceeds from classical topics to cutting-edge theory and applications, assuming only standard knowledge of calculus, linear algebra and differential equations. The book may serve as a basis for an introductory course in Riemannian geometry or an advanced course in sub-Riemannian geometry, covering elements of Hamiltonian dynamics, integrable systems and Lie theory. It will also be a valuable reference source for researchers in various disciplines.

Symmetry in Graphs Ted Dobson 2022-05-31 The first full-length book on the theme of symmetry in graphs, a fast-growing topic in algebraic graph theory.

Higher Categories and Homotopical Algebra Denis-Charles Cisinski 2019-04-30 At last, a friendly introduction to modern homotopy theory after Joyal and Lurie, reaching advanced tools and starting from scratch.

Derived Categories Amnon Yekutieli 2019-12-19 There have been remarkably few systematic expositions of the theory of derived categories since its inception in the work of Grothendieck and Verdier in the 1960s. This book is the first in-depth treatment of this important component of homological algebra. It

carefully explains the foundations in detail before moving on to key applications in commutative and noncommutative algebra, many otherwise unavailable outside of research articles. These include commutative and noncommutative dualizing complexes, perfect DG modules, and tilting DG bimodules. Written with graduate students in mind, the emphasis here is on explicit constructions (with many examples and exercises) as opposed to axiomatics, with the goal of demystifying this difficult subject. Beyond serving as a thorough introduction for students, it will serve as an important reference for researchers in algebra, geometry and mathematical physics.

Modern Analysis of Automorphic Forms By Example: Paul Garrett 2018-09-30 This is Volume 2 of a two-volume book that provides a self-contained introduction to the theory and application of automorphic forms, using examples to illustrate several critical analytical concepts surrounding and supporting the theory of automorphic forms. The two-volume book treats three instances, starting with some small unimodular examples, followed by adelic GL2, and finally GLn. Volume 2 features critical results, which are proven carefully and in detail, including automorphic Green's functions, metrics and topologies on natural function spaces, unbounded operators, vector-valued integrals, vector-valued holomorphic functions, and asymptotics. Volume 1 features discrete decomposition of cuspforms, meromorphic continuation of Eisenstein series, spectral decomposition of pseudo-Eisenstein series, and automorphic Plancherel theorem. With numerous proofs and extensive examples, this classroom-tested introductory text is meant for a second-year or advanced graduate course in automorphic forms, and also as a resource for researchers working in automorphic forms, analytic number theory, and related fields.

Singularly Perturbed Methods for Nonlinear Elliptic Problems Daomin Cao 2021-01-31 A systematic introduction to the singularly perturbed methods in the study of concentration solutions for nonlinear elliptic problems.

Toeplitz Matrices and Operators Nikolaï Nikolski 2020-01-31 A friendly introduction to Toeplitz theory and its applications throughout modern functional analysis.

Characters and Blocks of Finite Groups Gabriel Navarro 1998-05-07 This is a clear, accessible and up-to-

date exposition of modular representation theory of finite groups from a character-theoretic viewpoint. After a short review of the necessary background material, the early chapters introduce Brauer characters and blocks and develop their basic properties. The next three chapters study and prove Brauer's first, second and third main theorems in turn. These results are then applied to prove a major application of finite groups, the Glauberman Z*-theorem. Later chapters examine Brauer characters in more detail. The relationship between blocks and normal subgroups is also explored and the modular characters and blocks in p-solvable groups are discussed. Finally, the character theory of groups with a Sylow p-subgroup of order p is studied. Each chapter concludes with a set of problems. The book is aimed at graduate students, with some previous knowledge of ordinary character theory, and researchers studying the representation theory of finite groups.

Characters of Solvable Groups I. Martin Isaacs 2018-05-23 This book, which can be considered as a sequel of the author's famous book Character Theory of Finite Groups, concerns the character theory of finite solvable groups and other groups that have an abundance of normal subgroups. It is subdivided into three parts: -theory, character correspondences, and M-groups. The -theory section contains an exposition of D. Gajendragadkar's -special characters, and it includes various extensions, generalizations, and applications of his work. The character correspondences section proves the McKay character counting conjecture and the Alperin weight conjecture for solvable groups, and it constructs a canonical McKay bijection for odd-order groups. In addition to a review of some basic material on M-groups, the third section contains an exposition of the use of symplectic modules for studying M-groups. In particular, an accessible presentation of E. C. Dade's deep results on monomial characters of odd prime-power degree is included. Very little of this material has previously appeared in book form, and much of it is based on the author's research. By reading a clean and accessible presentation written by the leading expert in the field, researchers and graduate students will be inspired to learn and work in this area that has fascinated the author for decades.

Lectures on Random Lozenge Tilings Vadim Gorin 2021-09-09 Over the past 25 years, there has been an explosion of interest in the area of random tilings. The first book devoted to the topic, this timely text describes the mathematical theory of tilings. It starts from the most basic questions (which planar domains

are tileable?), before discussing advanced topics about the local structure of very large random tessellations. The author explains each feature of random tilings of large domains, discussing several different points of view and leading on to open problems in the field. The book is based on upper-division courses taught to a variety of students but it also serves as a self-contained introduction to the subject. Test your understanding with the exercises provided and discover connections to a wide variety of research areas in mathematics, theoretical physics, and computer science, such as conformal invariance, determinantal point processes, Gibbs measures, high-dimensional random sampling, symmetric functions, and variational problems.

Representations of Solvable Groups Olaf Manz 2014-05-14 Representation theory plays an important role in algebra, and in this book Manz and Wolf concentrate on that part of the theory which relates to solvable groups. The authors begin by studying modules over finite fields, which arise naturally as chief factors of solvable groups. The information obtained can then be applied to infinite modules, and in particular to character theory (ordinary and Brauer) of solvable groups. The authors include proofs of Brauer's height zero conjecture and the Alperin-McKay conjecture for solvable groups. Gluck's permutation lemma and Huppert's classification of solvable two-transive permutation groups, which are essentially results about finite modules of finite groups, play important roles in the applications and a new proof is given of the latter. Researchers into group theory, representation theory, or both, will find that this book has much to offer.

Formal Geometry and Bordism Operations Eric Peterson 2018-12-06 Delivers a broad, conceptual introduction to chromatic homotopy theory, focusing on contact with arithmetic and algebraic geometry.

Finite Groups 2003 Chat Yin Ho 2004-01-01 Dieser Band ist eine Sammlung von Forschungsartikeln zu endlichen Gruppen. Die behandelten Themen umfassen die Klassifikation von endlichen einfachen Gruppen, die Theorie der p-Gruppen, die Kohomologie von Gruppen, die Darstellungstheorie und die Theorie der Gebäude und der Geometrie.

Remote Compositional Analysis Janice L. Bishop 2019-11-30 Comprehensive overview of the

spectroscopic, mineralogical, and geochemical techniques used in planetary remote sensing.

Lectures on Logarithmic Algebraic Geometry Arthur Ogus 2018-11-08 A self-contained introduction to logarithmic geometry, a key tool for analyzing compactification and degeneration in algebraic geometry.

Refinements of Dade's Projective Conjecture Adam M. Glesser 2006

Groups St Andrews 2017 in Birmingham C. M. Campbell 2019-04-30 These proceedings of 'Groups St Andrews 2017' provide a snapshot of the state-of-the-art in contemporary group theory.

Buildings, Finite Geometries and Groups N.S. Narasimha Sastry 2011-11-13 This is the Proceedings of the ICM 2010 Satellite Conference on "Buildings, Finite Geometries and Groups" organized at the Indian Statistical Institute, Bangalore, during August 29 – 31, 2010. This is a collection of articles by some of the currently very active research workers in several areas related to finite simple groups, Chevalley groups and their generalizations: theory of buildings, finite incidence geometries, modular representations, Lie theory, etc. These articles reflect the current major trends in research in the geometric and combinatorial aspects of the study of these groups. The unique perspective the authors bring in their articles on the current developments and the major problems in their area is expected to be very useful to research mathematicians, graduate students and potential new entrants to these areas.

Proceedings Of The International Congress Of Mathematicians 2018 (Icm 2018) (In 4 Volumes) Sirakov Boyan 2019-02-27 The Proceedings of the ICM publishes the talks, by invited speakers, at the conference organized by the International Mathematical Union every 4 years. It covers several areas of Mathematics and it includes the Fields Medal and Nevanlinna, Gauss and Leelavati Prizes and the Chern Medal laudatios.

Functional Analysis Jan van Neerven 2022-07-07 This comprehensive introduction to functional analysis covers both the abstract theory and applications to spectral theory, the theory of partial differential equations, and quantum mechanics. It starts with the basic results of the subject and progresses towards

a treatment of several advanced topics not commonly found in functional analysis textbooks, including Fredholm theory, form methods, boundary value problems, semigroup theory, trace formulas, and a mathematical treatment of states and observables in quantum mechanics. The book is accessible to graduate students with basic knowledge of topology, real and complex analysis, and measure theory. With carefully written out proofs, more than 300 problems, and appendices covering the prerequisites, this self-contained volume can be used as a text for various courses at the graduate level and as a reference text for researchers in the field.

Combinatorial Game Theory Richard J. Nowakowski 2022-08-22 This volume is dedicated to the work of three leading mathematicians in combinatoric game theory, Elwyn Berlekamp, John Conway, and Richard Guy and includes 20 contributions from colleagues reflecting on their work.

Information Theory, Inference and Learning Algorithms David J. C. MacKay 2003-09-25 Table of contents

Representations of Solvable Groups Olaf Manz 1993-09-16 Representation theory plays an important role in algebra, and in this book Manz and Wolf concentrate on that part of the theory which relates to solvable groups. The authors begin by studying modules over finite fields, which arise naturally as chief factors of solvable groups. The information obtained can then be applied to infinite modules, and in particular to character theory (ordinary and Brauer) of solvable groups. The authors include proofs of Brauer's height zero conjecture and the Alperin-McKay conjecture for solvable groups. Gluck's permutation lemma and Huppert's classification of solvable two-transive permutation groups, which are essentially results about finite modules of finite groups, play important roles in the applications and a new proof is given of the latter. Researchers into group theory, representation theory, or both, will find that this book has much to offer.

The Block Theory of Finite Group Algebras: Markus Linckelmann 2018-05-24 This is a comprehensive introduction to the modular representation theory of finite groups, with an emphasis on block theory. The two volumes take into account classical results and concepts as well as some of the modern developments in the area. Volume 1 introduces the broader context, starting with general properties of

finite group algebras over commutative rings, moving on to some basics in character theory and the structure theory of algebras over complete discrete valuation rings. In Volume 2, blocks of finite group algebras over complete p-local rings take centre stage, and many key results which have not appeared in a book before are treated in detail. In order to illustrate the wide range of techniques in block theory, the book concludes with chapters classifying the source algebras of blocks with cyclic and Klein four defect groups, and relating these classifications to the open conjectures that drive block theory.

The Character Theory of Finite Groups of Lie Type Meinolf Geck 2020-02-27 A comprehensive guide to the vast literature and range of results around Lusztig's character theory of finite groups of Lie type.

Generators of Markov Chains Adam Bobrowski 2020-11-30 Elementary treatments of Markov chains, especially those devoted to discrete-time and finite state-space theory, leave the impression that everything is smooth and easy to understand. This exposition of the works of Kolmogorov, Feller, Chung, Kato and other mathematical luminaries focuses on time-continuous chains but is not so far from being elementary itself. It reminds us once again that the first impression is false: an infinite, but denumerable state-space is where the fun begins. If you have not heard of Blackwell's example (in which all states are instantaneous), do not understand what the minimal process is, or do not know what happens after explosion, dive right in. But beware lest you are enchanted: 'There are more spells than your commonplace magicians ever dreamed of.'

Introduction to Representation Theory Pavel I. Etingof 2011 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 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.

Higher Index Theory Rufus Willett 2020-06-30 A friendly introduction to higher index theory, a rapidly-developing subject at the intersection of geometry, topology and operator algebras. A well-balanced combination of introductory material (with exercises), cutting-edge developments and references to the wider literature make this book a valuable guide for graduate students and experts alike.

Modern Analysis of Automorphic Forms By Example: Paul Garrett 2018-09-30 This is Volume 1 of a two-volume book that provides a self-contained introduction to the theory and application of automorphic forms, using examples to illustrate several critical analytical concepts surrounding and supporting the theory of automorphic forms. The two-volume book treats three instances, starting with some small unimodular examples, followed by adelic GL2, and finally GLn. Volume 1 features critical results, which are proven carefully and in detail, including discrete decomposition of cuspforms, meromorphic continuation of Eisenstein series, spectral decomposition of pseudo-Eisenstein series, and automorphic Plancherel theorem. Volume 2 features automorphic Green's functions, metrics and topologies on natural function spaces, unbounded operators, vector-valued integrals, vector-valued holomorphic functions, and asymptotics. With numerous proofs and extensive examples, this classroom-tested introductory text is meant for a second-year or advanced graduate course in automorphic forms, and also as a resource for researchers working in automorphic forms, analytic number theory, and related fields.

Character Theory and the McKay Conjecture Gabriel Navarro 2018-04-26 The McKay conjecture is the origin of the counting conjectures in the representation theory of finite groups. This book gives a comprehensive introduction to these conjectures, while assuming minimal background knowledge. Character theory is explored in detail along the way, from the very basics to the state of the art. This includes not only older theorems, but some brand new ones too. New, elegant proofs bring the reader up to date on progress in the field, leading to the final proof that if all finite simple groups satisfy the inductive McKay condition, then the McKay conjecture is true. Open questions are presented throughout the book, and each chapter ends with a list of problems, with varying degrees of difficulty.