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Interpolation and Approximation by Polynomials - George M. Phillips 2006-04-06
In addition to coverage of univariate interpolation and approximation, the text includes material on multivariate interpolation and multivariate numerical integration, a generalization of the Bernstein polynomials that has not previously appeared in book form, and a greater coverage of Peano kernel theory than is found in most textbooks. There are many worked examples and each section ends with a number of carefully selected problems that extend the student's understanding of the text. The author is well known for his clarity of writing and his many contributions as a researcher in approximation theory.
Functional Analysis and Infinite-Dimensional Geometry - Marian Fabian 2013-04-17
This book introduces the basic principles of functional analysis and areas of Banach space theory that are close to nonlinear analysis and topology. The text can be used in graduate courses or for independent study. It includes a large number of exercises of different levels of difficulty, accompanied by hints.
Non-Local Cell Adhesion Models - Andreas Buttenschön 2021-06-09
This monograph considers the mathematical modeling of cellular adhesion, a key interaction force in cell biology. While deeply grounded in the biological application of cell adhesion and tissue formation, this monograph focuses on the mathematical analysis of non-local adhesion models. The novel aspect is the non-local term (an integral operator), which accounts for forces generated by long ranged cell interactions. The analysis of non-local models has started only recently, and it has become a vibrant area of applied mathematics. This monograph contributes a systematic analysis of steady states and their bifurcation structure, combining global bifurcation results pioneered by Rabinowitz, equivariant bifurcation theory, and the symmetries of the non-local term. These methods allow readers to analyze and understand cell adhesion on a deep level.
Total Domination in Graphs - Michael A. Henning 2014-07-08
Total Domination in Graphs gives a clear understanding of this topic to any interested reader who has a modest background in graph theory. This book provides and explores the fundamentals of total domination in graphs. Some of the topics featured include the interplay between total domination in graphs and transversals in hypergraphs, and the association with total domination in graphs and diameter-2-critical graphs. Several proofs are included in this text which enables readers to acquaint themselves with a toolbox of proof techniques and ideas with which to attack open problems in the field. This work is an excellent resource for students interested in beginning their research in this field. Additionally, established researchers will find the book valuable to have as it contains the latest developments and open problems.
Mathematics and Its History - John Stillwell 2020-11-07
This textbook provides a unified and concise exploration of undergraduate mathematics by approaching the subject through its history. Readers will discover the rich tapestry of ideas behind familiar topics from the undergraduate curriculum, such as calculus, algebra, topology, and more. Featuring historical episodes ranging from the Ancient Greeks to Fermat and Descartes, this volume offers a glimpse into the broader context in which these ideas developed, revealing unexpected connections that make this ideal for a senior capstone course. The presentation of previous versions has been refined by omitting the less mainstream topics and inserting new connecting material, allowing instructors to cover the book in a one-semester course. This condensed edition prioritizes succinctness and cohesiveness, and there is a greater emphasis on visual clarity, featuring full color images and high quality 3D models. As in previous editions, a wide array of mathematical topics are covered, from geometry to computation; however, biographical sketches have been omitted. Mathematics and Its History: A Concise Edition is an essential resource for courses or reading programs on the history of mathematics. Knowledge of basic calculus, algebra, geometry, topology, and set theory is assumed. From reviews of previous editions: "Mathematics and Its History is a joy to read. The writing is clear, concise and inviting. The style is very different from a traditional text. I found myself picking it up to read at the expense of my usual late evening thriller or detective novel.... The author has done a wonderful job of tying together the dominant themes of undergraduate mathematics." Richard J. Wilders, MAA, on the Third Edition "The book...is presented in a lively style without unnecessary detail. It is very stimulating and will be appreciated not only by students. Much attention is paid to problems and to the development of mathematics before the end of the nineteenth century.... This book brings to the non-specialist interested in mathematics many interesting results. It can be recommended for seminars and will be enjoyed by the broad mathematical community." European Mathematical Society, on the Second Edition
Research in History and Philosophy of Mathematics - Maria Zack 2016-12-15
This volume contains seventeen papers that were presented at the 2015 Annual Meeting of the Canadian Society for History and Philosophy of Mathematics/La Société Canadienne d'Histoire et de Philosophie des Mathématiques, held in Washington, D.C. In addition to showcasing rigorously reviewed modern scholarship on an interesting variety of general topics in the history and philosophy of mathematics, this meeting also honored the memories of Jacqueline (Jackie) Stedall and Ivor Grattan-Guinness; celebrated the Centennial of the Mathematical Association of America; and considered the importance of mathematical communities in a special session. These themes and many others are explored in these collected papers, which cover subjects such as New evidence that the Latin translation of Euclid's Elements was based on the Arabic version attributed to al-Ḥajjāj Work done on the arc rampant in the seventeenth century The history of numerical methods for finding roots of nonlinear equations An original play featuring a dialogue between George Boole and Augustus De Morgan that explores the relationship between them Key issues in the digital preservation of mathematical material for future generations A look at the first twenty-five years of The American Mathematical Monthly in the context of the evolving American mathematical community The growth of Math Circles and the unique ways they are being implemented in the United States Written by leading scholars in the field, these papers will be accessible to not only mathematicians and students of the history and philosophy of mathematics, but also anyone with a general interest in mathematics.
Reflection Groups and Invariant Theory - Richard Kane 2001
Reflection groups and invariant theory is a branch of mathematics that lies at the intersection between geometry and algebra. The book contains a deep and elegant theory, evolved from various graduate courses given by the author over the past 10 years.
Multiple-point Geostatistics - Professor Gregoire Mariethoz 2014-10-16
This book provides a comprehensive introduction to multiple-point geostatistics, where spatial continuity is described using training images. Multiple-point geostatistics aims at bridging the gap between physical

modelling/realism and spatio-temporal stochastic modelling. The book provides an overview of this new field in three parts. Part I presents a conceptual comparison between traditional random function theory and stochastic modelling based on training images, where random function theory is not always used. Part II covers in detail various algorithms and methodologies starting from basic building blocks in statistical science and computer science. Concepts such as non-stationary and multi-variate modeling, consistency between data and model, the construction of training images and inverse modelling are treated. Part III covers three example application areas, namely, reservoir modelling, mineral resources modelling and climate model downscaling. This book will be an invaluable reference for students, researchers and practitioners of all areas of the Earth Sciences where forecasting based on spatio-temporal data is performed.

Dynamical Systems in Population Biology - Xiao-Qiang Zhao 2013-06-05
Population dynamics is an important subject in mathematical biology. A cen tral problem is to study the long-term behavior of modeling systems. Most of these systems are governed by various evolutionary equations such as difference, ordinary, functional, and partial differential equations (see, e. g. , [165, 142, 218, 119, 55]). As we know, interactive populations often live in a fluctuating environment. For example, physical environmental conditions such as temperature and humidity and the availability of food, water, and other resources usually vary in time with seasonal or daily variations. Therefore, more realistic models should be nonautonomous systems. In particular, if the data in a model are periodic functions of time with commensurate period, a periodic system arises; if these periodic functions have different (minimal) periods, we get an almost periodic system. The existing reference books, from the dynamical systems point of view, mainly focus on autonomous biological systems. The book of Hess [106J is an excellent reference for periodic parabolic boundary value problems with applications to population dynamics. Since the publication of this book there have been extensive investigations on periodic, asymptotically periodic, almost periodic, and even general nonautonomous biological systems, which in turn have motivated further development of the theory of dynamical systems. In order to explain the dynamical systems approach to periodic population problems, let us consider, as an illustration, two species periodic competitive systems dUI dt = !I(t,Ul,U2), (0.

Cubic Fields with Geometry - Samuel A. Hambleton 2018-11-07
The objective of this book is to provide tools for solving problems which involve cubic number fields. Many such problems can be considered geometrically; both in terms of the geometry of numbers and geometry of the associated cubic Diophantine equations that are similar in many ways to the Pell equation. With over 50 geometric diagrams, this book includes illustrations of many of these topics. The book may be thought of as a companion reference for those students of algebraic number theory who wish to find more examples, a collection of recent research results on cubic fields, an easy-to-understand source for learning about Voronoi's unit algorithm and several classical results which are still relevant to the field, and a book which helps bridge a gap in understanding connections between algebraic geometry and number theory. The exposition includes numerous discussions on calculating with cubic fields including simple continued fractions of cubic irrational numbers, arithmetic using integer matrices, ideal class group computations, lattices over cubic fields, construction of cubic fields with a given discriminant, the search for elements of norm 1 of a cubic field with rational parametrization, and Voronoi's algorithm for finding a system of fundamental units. Throughout, the discussions are framed in terms of a binary cubic form that may be used to describe a given cubic field. This unifies the chapters of this book despite the diversity of their number theoretic topics.

The Laser Inventor - Theodore H. Maiman 2017-12-21
In these engaging memoirs of a maverick, Theodore H. Maiman describes the life events leading to his invention of the laser in 1960. Maiman succeeded using his expertise in physics and engineering along with an ingenious and elegant design not anticipated by others. His pink ruby laser produced mankind's first-ever coherent light and has provided transformational technology for commerce, industry, telecom, the Internet, medicine, and all the sciences. Maiman also chronicles the resistance from his employer and the ongoing intrigue by competing researchers in industry and academia seeking to diminish his contribution in inventing the first laser. This work will appeal to a wide readership, from physicists and engineers through

science enthusiasts to general readers. The volume includes extensive photos and documentary materials related to Maiman's life and accomplishments never before published. "No one beat Maiman to the laser. How important is the laser? How important are all lasers? That is how important we have to regard Maiman's contribution.He and the laser changed all of our lives, everyone's!"Dr. Nick Holonyak, Jr., Professor of Electrical and Computer Engineering and Physics, University of Illinois at Champaigne-Urbana, and inventor of the light-emitting diode (LED) and co-inventor of the transistor laser "More than five decades later, we can safely conclude that Theodore Maiman's groundbreaking discovery changed the world. Our modern life just as scientific research would be quite different without the laser."Dr. Ferenc Krausz, Director, Max Planck Institute for Quantum Optics, Garching, Germany, and Professor of Physics, Ludwig Maximilian University, Munich, and pioneer in attosecond lasers and attophysics "Maiman had the stroke of genius needed to take a different approach [from his competitors]. The sheer elegance and simplicity of his design belies the intellectual achievement it represents. If his invention seems obvious to some today, it was far from obvious in 1960."Jeff Hecht, authoritative science writer on the historical development of the laser, author of books on lasers and fiber optics

Fundamentals of Geometry Construction - Jorge Angeles 2020-04-18
The textbook provides both beginner and experienced CAD users with the math behind the CAD. The geometry tools introduced here help the reader exploit commercial CAD software to its fullest extent. In fact, the book enables the reader to go beyond what CAD software packages offer in their menus. Chapter 1 summarizes the basic Linear and Vector Algebra pertinent to vectors in 3D, with some novelties: the 2D form of the vector product and the manipulation of "larger" matrices and vectors by means of block-partitioning of larger arrays. In chapter 2 the relations among points, lines and curves in the plane are revised accordingly; the difference between curves representing functions and their geometric counterparts is emphasized. Geometric objects in 3D, namely, points, planes, lines and surfaces are the subject of chapter 3; of the latter, only quadrics are studied, to keep the discussion at an elementary level, but the interested reader is guided to the literature on splines. The concept of affine transformations, at the core of CAD software, is introduced in chapter 4, which includes applications of these transformations to the synthesis of curves and surfaces that would be extremely cumbersome to produce otherwise. The book, catering to various disciplines such as engineering, graphic design, animation and architecture, is kept discipline-independent, while including examples of interest to the various disciplines. Furthermore, the book can be an invaluable complement to undergraduate lectures on CAD.

Early Childhood Mathematics Skill Development in the Home Environment - Belinda Blevins-Knabe 2016-10-17
This volume presents current research on the connections between the home and family environment on children's mathematics development. Focusing on infancy through first grade, it details the role of parents and other caregivers in promoting numeracy and the ways their active participation can prepare young children for learning about formal mathematics. Research data answer key questions regarding the development of numeracy alongside cognitive and linguistic skills, early acquisition of specific math skills, and numeracy of children with atypical language skills. The book also provides practical recommendations for parents and other caregivers as well as implications for future research studies and curriculum design. Included in the coverage: Ways to optimize home numeracy environments. Individual differences in numerical abilities. Cross-cultural comparisons and ways to scaffold young children's mathematical skills. Mathematics and language in the home environment. Center-based and family-based child care. Games and home numeracy practice. Early Childhood Mathematics Skill Development in the Home Environment is an essential resource for researchers, graduate students, and professionals in infancy and early childhood development, child and school psychology, early childhood education, social work, mathematics education, and educational psychology.

Putnam and Beyond - Răzvan Gelca 2017-09-19
This book takes the reader on a journey through the world of college mathematics, focusing on some of the most important concepts and results in the theories of polynomials, linear algebra, real analysis, differential equations, coordinate geometry, trigonometry, elementary number theory, combinatorics, and probability. Preliminary material provides an overview of common methods of proof: argument by contradiction,

mathematical induction, pigeonhole principle, ordered sets, and invariants. Each chapter systematically presents a single subject within which problems are clustered in each section according to the specific topic. The exposition is driven by nearly 1300 problems and examples chosen from numerous sources from around the world; many original contributions come from the authors. The source, author, and historical background are cited whenever possible. Complete solutions to all problems are given at the end of the book. This second edition includes new sections on quad ratic polynomials, curves in the plane, quadratic fields, combinatorics of numbers, and graph theory, and added problems or theoretical expansion of sections on polynomials, matrices, abstract algebra, limits of sequences and functions, derivatives and their applications, Stokes' theorem, analytical geometry, combinatorial geometry, and counting strategies. Using the W.L. Putnam Mathematical Competition for undergraduates as an inspiring symbol to build an appropriate math background for graduate studies in pure or applied mathematics, the reader is eased into transitioning from problem-solving at the high school level to the university and beyond, that is, to mathematical research. This work may be used as a study guide for the Putnam exam, as a text for many different problem-solving courses, and as a source of problems for standard courses in undergraduate mathematics. Putnam and Beyond is organized for independent study by undergraduate and gradu ate students, as well as teachers and researchers in the physical sciences who wish to expand their mathematical horizons.

Using the Mathematics Literature - Kristine K. Fowler 2004-05-25
This reference serves as a reader-friendly guide to every basic tool and skill required in the mathematical library and helps mathematicians find resources in any format in the mathematics literature. It lists a wide range of standard texts, journals, review articles, newsgroups, and Internet and database tools for every major subfield in mathematics

Encyclopedia of Mathematical Geosciences - B. S. Daya Sagar 2023-06-29
The Encyclopedia of Mathematical Geosciences is a complete and authoritative reference work. It provides concise explanation on each term that is related to Mathematical Geosciences. Over 300 international scientists, each expert in their specialties, have written around 350 separate articles on different topics of mathematical geosciences including contributions on Artificial Intelligence, Big Data, Compositional Data Analysis, Geomathematics, Geostatistics, Geographical Information Science, Mathematical Morphology, Mathematical Petrology, Multifractals, Multiple Point Statistics, Spatial Data Science, Spatial Statistics, and Stochastic Process Modeling. Each topic incorporates cross-referencing to related articles, and also has its own reference list to lead the reader to essential articles within the published literature. The entries are arranged alphabetically, for easy access, and the subject and author indices are comprehensive and extensive.

The Art of Theoretical Biology - Franziska Matthäus 2020-04-16
This beautifully crafted book collects images, which were created during the process of research in all fields of theoretical biology. Data analysis, numerical treatment of a model, or simulation results yield stunning images, which represent pieces of art just by themselves. The approach of the book is to present for each piece of visualization a lucid synopsis of the scientific background as well as an outline of the artistic vision.

Supermath - Anna Weltman 2020-09-01
Drawing on history and current events, Weltman tackles five fascinating questions: Is math the universal language? Can math eliminate bias? Can math predict the next move? Can math open doors? And finally, What is genuine beauty? Supermath is an enlightening book that pursues complex lines of mathematical thought while providing a fascinating lens into global problems and human culture as a whole.

Combined Membership List of the American Mathematical Society, Mathematical Association of America, and the Society for Industrial and Applied Mathematics - American Mathematical Society 2003

Elementary Differential Geometry - A.N. Pressley 2010-03-10
Elementary Differential Geometry presents the main results in the differential geometry of curves and surfaces suitable for a first course on the subject. Prerequisites are kept to an absolute minimum – nothing beyond first courses in linear algebra and multivariable calculus – and the most direct and straightforward

approach is used throughout. New features of this revised and expanded second edition include: a chapter on non-Euclidean geometry, a subject that is of great importance in the history of mathematics and crucial in many modern developments. The main results can be reached easily and quickly by making use of the results and techniques developed earlier in the book. Coverage of topics such as: parallel transport and its applications; map colouring; holonomy and Gaussian curvature. Around 200 additional exercises, and a full solutions manual for instructors, available via www.springer.com ul

Convexity and Well-Posed Problems - Roberto Lucchetti 2006-02-02
This book deals mainly with the study of convex functions and their behavior from the point of view of stability with respect to perturbations. We shall consider convex functions from the most modern point of view: a function is de?ned to be convex whenever its epigraph, the set of the points lying above the graph, is a convex set. Thus many of its properties can be seen also as properties of a certain convex set related to it. Moreover, we shall consider extended real valued functions, i. e. , functions taking possibly the values?? and +?. The reason for considering the value +? is the powerful device of including the constraint set of a constrained minimum problem into the objective function itself (by rede?ning it as +? outside the constraint set). Except for trivial cases, the minimum value must be taken at a point where the function is not +?, hence at a point in the constraint set. And the value ?? is allowed because useful operations, such as the inf-convolution, can give rise to functions valued?? even when the primitive objects are real valued. Observe that de?ning the objective function to be +? outside the closed constraint set preserves lower semicontinuity, which is the pivotal and mi- mal continuity assumption one needs when dealing with minimum problems. Variational calculus is usually based on derivatives.

Introduction to Riemann Surfaces - George Springer 2001
Covers the classical theory of abstract Riemann surfaces. This book presents the requisite function theory and topology for Riemann surfaces. It also covers differentials and uniformization. For compact Riemann surfaces, it features topics such as divisors, Weierstrass points, and the Riemann-Roch theorem.

Becoming a Mathematics Teacher - Tony Brown 2011-02-08
The book is centered on how major curriculum reform shapes mathematics and the professional practices of teachers. This book documents in real time the implementation of a major government numeracy programme and its receipt by trainee and new teachers. It documents the complete life span of that initiative. The account is targeted at an international readership in terms of how curriculum reform more generally shapes mathematics in schools and the practices of teachers. A key dimension of the book is an alternative view of mathematics education research in which the task of teacher development is understood at policy level where large numbers of teachers were interviewed to assess how policies were being processed through individuals. The book provides an easy and accessible commentary utilising contemporary theory to describe how such teachers reconcile their personal aspirations with the external demands they encounter in negotiating their identities as professional teachers.

Convex Functions and Their Applications - Constantin P. Niculescu 2018-06-08
Thorough introduction to an important area of mathematics Contains recent results Includes many exercises

The Little Book of Bigger Primes - Paulo Ribenboim 2006-06-01
A deep understanding of prime numbers is one of the great challenges in mathematics. In this new edition, fundamental theorems, challenging open problems, and the most recent computational records are presented in a language without secrets. The impressive wealth of material and references will make this book a favorite companion and a source of inspiration to all readers. Paulo Ribenboim is Professor Emeritus at Queen's University in Canada, Fellow of the Royal Society of Canada, and recipient of the George Pólya Award of the Mathematical Association of America. He is the author of 13 books and more than 150 research articles. From the reviews of the First Edition: Number Theory and mathematics as a whole will benefit from having such an accessible book exposing advanced material. There is no question that this book will succeed in exciting many new people to the beauty and fascination of prime numbers, and will probably bring more young people to research in these areas. (Andrew Granville, Zentralblatt)

The Geometry of Infinite-Dimensional Groups - Boris Khesin 2008-09-28
This monograph gives an overview of various classes of infinite-dimensional Lie groups and their

applications in Hamiltonian mechanics, fluid dynamics, integrable systems, gauge theory, and complex geometry. The text includes many exercises and open questions.

Combined Membership List of the American Mathematical Society and the Mathematical Association of America - American Mathematical Society 2002

Lattice Theory: Foundation - George Grätzer 2011-02-14
This book started with Lattice Theory, First Concepts, in 1971. Then came General Lattice Theory, First Edition, in 1978, and the Second Edition twenty years later. Since the publication of the first edition in 1978, General Lattice Theory has become the authoritative introduction to lattice theory for graduate students and the standard reference for researchers. The First Edition set out to introduce and survey lattice theory. Some 12,000 papers have been published in the field since then; so Lattice Theory: Foundation focuses on introducing the field, laying the foundation for special topics and applications. Lattice Theory: Foundation, based on the previous three books, covers the fundamental concepts and results. The main topics are distributivity, congruences, constructions, modularity and semimodularity, varieties, and free products. The chapter on constructions is new, all the other chapters are revised and expanded versions from the earlier volumes. Almost 40 "diamond sections'', many written by leading specialists in these fields, provide a brief glimpse into special topics beyond the basics. "Lattice theory has come a long way... For those who appreciate lattice theory, or who are curious about its techniques and intriguing internal problems, Professor Grätzer's lucid new book provides a most valuable guide to many recent developments. Even a cursory reading should provide those few who may still believe that lattice theory is superficial or naive, with convincing evidence of its technical depth and sophistication." Bulletin of the American Mathematical Society "Grätzer's book General Lattice Theory has become the lattice theorist's bible." Mathematical Reviews

Handbook of the Mathematics of the Arts and Sciences - Bharath Sriraman 2021-08-15
The goal of this Handbook is to become an authoritative source with chapters that show the origins, unification, and points of similarity between different disciplines and mathematics. Some chapters will also show bifurcations and the development of disciplines which grow to take on a life of their own. Science and Art are used as umbrella terms to encompass the physical, natural and geological sciences, as well as the visual and performing arts. As arts imagine possibilities, science attempts to generate models to test possibilities, mathematics serves as the tool. This handbook is an indispensable collection to understand todays effort to build bridges between disciplines. It answers questions such as: What are the origins of interdisciplinarity in mathematics? What are cross-cultural components of interdisciplinarity linked to mathematics? What are contemporary interdisciplinary trends? Section Editors: Michael J. Ostwald, University of Newcastle (Australia) Kyeong-Hwa Lee, Seoul National University (South Korea) Torsten Lindström, Linnaeus University (Sweden) Gizem Karaali, Pomona College (USA) Ken Valente, Colgate University, (USA) Consulting Editors: Alexandre Borovik, Manchester University (UK) Daina Taimina, Independent Scholar, Cornell University (USA) Nathalie Sinclair, Simon Fraser University (Canada) What do figure skating, invasive species, medieval cathedrals, ropes, poems, wines, metaphors, rhythms, climate change, and origami have in common? Mathematics! The Handbook of the Mathematics of the Arts and Sciences is a stunning compendium of essays on these and scores of other unlikely subjects to which the mathematical imagination has been brought. It is at once a dazzlingly contemporary tour of human success at bringing order to the world, and a throwback to a time before the "unity of knowledge" became a mere slogan. It is a breathtaking work, for its ambitious scope and for its endless stimulation of the reader's curiosity. - Harry R. Lewis, Gordon McKay Research Professor of Computer Science at Harvard University, editor of Ideas That Created the Future: Classic Papers of Computer Science Mathematics has always enjoyed deep connections with the arts, science, the humanities, philosophy, history, and society in general. However, these links are often overlooked or undervalued. This Handbook makes a massive statement about the extent and importance of the interdisciplinary nature of mathematics, and its relevance to all aspects of human culture. Its articles are scholarly and authoritative, but also highly readable and accessible to non-specialists. A triumph! -Ian Stewart FRS, Emeritus Professor - University of Warwick This handbook will delight anyone who loves the richness of mathematics and its interplay with the arts and humanities. Bharath Sriraman has given us a great gift, a treasure chest of connections to art and architecture, language and literature, philosophy, history, society, you name it. The book is authoritative and charming and instantly establishes itself as a landmark reference for interdisciplinary mathematics. Steven Strogatz - Jacob Gould Schurman Professor of Applied Mathematics at Cornell University.

Research Directions in Number Theory - Jennifer S. Balakrishnan 2019-08-01
These proceedings collect several number theory articles, most of which were written in connection to the workshop WIN4: Women in Numbers, held in August 2017, at the Banff International Research Station (BIRS) in Banff, Alberta, Canada. It collects papers disseminating research outcomes from collaborations initiated during the workshop as well as other original research contributions involving participants of the WIN workshops. The workshop and this volume are part of the WIN network, aimed at highlighting the research of women and gender minorities in number theory as well as increasing their participation and boosting their potential collaborations in number theory and related fields.

Emigrating Beyond Earth - Cameron M Smith 2012-06-09
Emigrating Beyond Earth puts space colonization into the context of human evolution. Rather than focusing on the technologies and strategies needed to colonize space, the authors examine the human and societal reasons for space colonization. They make space colonization seems like a natural step by demonstrating that if will continue the human species' 4 million-year-old legacy of adaptation to difficult new environments. The authors present many examples from the history of human expansion into new environments, including two amazing tales of human colonization - the prehistoric settlement of the upper Arctic around 5,000 years ago and the colonization of the Pacific islands around 3,000 years ago - which show that space exploration is no more about rockets and robots that Arctic exploration was about boating!

A Primer of Subquasivariety Lattices - Kira Adaricheva 2022-08-20
This book addresses Birkhoff and Mal'cev's problem of describing subquasivariety lattices. The text begins by developing the basics of atomic theories and implicational theories in languages that may, or may not, contain equality. Subquasivariety lattices are represented as lattices of closed algebraic subsets of a lattice with operators, which yields new restrictions on the equaclosure operator. As an application of this new approach, it is shown that completely distributive lattices with a dually compact least element are subquasivariety lattices. The book contains many examples to illustrate these principles, as well as open problems. Ultimately this new approach gives readers a set of tools to investigate classes of lattices that can be represented as subquasivariety lattices.

All of Statistics - Larry Wasserman 2013-12-11
Taken literally, the title "All of Statistics" is an exaggeration. But in spirit, the title is apt, as the book does cover a much broader range of topics than a typical introductory book on mathematical statistics. This book is for people who want to learn probability and statistics quickly. It is suitable for graduate or advanced undergraduate students in computer science, mathematics, statistics, and related disciplines. The book includes modern topics like non-parametric curve estimation, bootstrapping, and classification, topics that are usually relegated to follow-up courses. The reader is presumed to know calculus and a little linear algebra. No previous knowledge of probability and statistics is required. Statistics, data mining, and machine learning are all concerned with collecting and analysing data.

Measure, Integration & Real Analysis - Sheldon Axler 2019-11-29
This open access textbook welcomes students into the fundamental theory of measure, integration, and real analysis. Focusing on an accessible approach, Axler lays the foundations for further study by promoting a deep understanding of key results. Content is carefully curated to suit a single course, or two-semester sequence of courses, creating a versatile entry point for graduate studies in all areas of pure and applied mathematics. Motivated by a brief review of Riemann integration and its deficiencies, the text begins by immersing students in the concepts of measure and integration. Lebesgue measure and abstract measures are developed together, with each providing key insight into the main ideas of the other approach. Lebesgue integration links into results such as the Lebesgue Differentiation Theorem. The development of products of abstract measures leads to Lebesgue measure on Rn. Chapters on Banach spaces, Lp spaces, and Hilbert spaces showcase major results such as the Hahn–Banach Theorem, Hölder's Inequality, and the Riesz Representation Theorem. An in-depth study of linear maps on Hilbert spaces culminates in the

Spectral Theorem and Singular Value Decomposition for compact operators, with an optional interlude in real and complex measures. Building on the Hilbert space material, a chapter on Fourier analysis provides an invaluable introduction to Fourier series and the Fourier transform. The final chapter offers a taste of probability. Extensively class tested at multiple universities and written by an award-winning mathematical expositor, Measure, Integration & Real Analysis is an ideal resource for students at the start of their journey into graduate mathematics. A prerequisite of elementary undergraduate real analysis is assumed; students and instructors looking to reinforce these ideas will appreciate the electronic Supplement for Measure, Integration & Real Analysis that is freely available online.

Books in Series - 1985
Vols. for 1980- issued in three parts: Series, Authors, and Titles.

An Introduction to Complex Systems - Paul Fieguth 2016-11-26
This undergraduate text explores a variety of large-scale phenomena - global warming, ice ages, water, poverty - and uses these case studies as a motivation to explore nonlinear dynamics, power-law statistics, and complex systems. Although the detailed mathematical descriptions of these topics can be challenging, the consequences of a system being nonlinear, power-law, or complex are in fact quite accessible. This book blends a tutorial approach to the mathematical aspects of complex systems together with a complementary narrative on the global/ecological/societal implications of such systems. Nearly all engineering undergraduate courses focus on mathematics and systems which are small scale, linear, and Gaussian. Unfortunately there is not a single large-scale ecological or social phenomenon that is scalar, linear, and Gaussian. This book offers students insights to better understand the large-scale problems facing the world and to realize that these cannot be solved by a single, narrow academic field or perspective. Instead, the book seeks to emphasize understanding, concepts, and ideas, in a way that is mathematically rigorous, so that the concepts do not feel vague, but not so technical that the mathematics get in the way. The book is intended for undergraduate students in a technical domain such as engineering, computer science, physics, mathematics, and environmental studies.

Heavy-Tail Phenomena - Sidney I. Resnick 2007
This comprehensive text gives an interesting and useful blend of the mathematical, probabilistic and statistical tools used in heavy-tail analysis. It is uniquely devoted to heavy-tails and emphasizes both probability modeling and statistical methods for fitting models. Prerequisites for the reader include a prior course in stochastic processes and probability, some statistical background, some familiarity with time series analysis, and ability to use a statistics package. This work will serve second-year graduate students and researchers in the areas of applied mathematics, statistics, operations research, electrical engineering, and economics.

Reading, Writing, and Proving - Ulrich Daepp 2006-04-18
This book, based on Pólya's method of problem solving, aids students in their transition to higher-level mathematics. It begins by providing a great deal of guidance on how to approach definitions, examples, and theorems in mathematics and ends by providing projects for independent study. Students will follow Pólya's four step process: learn to understand the problem; devise a plan to solve the problem; carry out that plan; and look back and check what the results told them.

Probability and Real Trees - Steven N. Evans 2007-09-26
Random trees and tree-valued stochastic processes are of particular importance in many fields. Using the framework of abstract "tree-like" metric spaces and ideas from metric geometry, Evans and his collaborators have recently pioneered an approach to studying the asymptotic behavior of such objects when the number of vertices goes to infinity. This publication surveys the relevant mathematical background and present some selected applications of the theory.

Turbulent Times in Mathematics - Elaine McKinnon Riehm 2011-11-03
Despite the renown of the Fields Medals, J.C. Fields has been until now a rather obscure figure, and recovering details about his professional activities and personal life was not at all a simple task. This work is a triumph of persistence with far-flung archival and documentary sources, and provides a rich non-mathematical portrait of the man in all aspects of his life and career. Highly readable and replete with period detail, the book sheds useful light on the mathematical and scientific world of Fields' time, and is sure to remain the definitive biographical study. --Tom Archibald, Simon Fraser University, Burnaby, BC, Canada Drawing on a wide array of archival sources, Riehm and Hoffman provide a vivid account of Fields' life and his part in the founding of the highest award in mathematics. Filled with intriguing detail--from a childhood on the shores of Lake Ontario, through the mathematics seminars of late 19th century Berlin, to the post-WW1 years of the fragmented international mathematical community--it is a richly textured story engagingly and sympathetically told. Read this book and you will understand why Fields never wanted the medal to bear his name and yet why, quite rightly, it does. --June Barrow-Green, Open University, Milton Keynes, United Kingdom One of the little-known effects of World War I was the collapse of international scientific cooperation. In mathematics, the discord continued after the war's end and after the Treaty of Versailles had been signed in 1919. Many distinguished scientists were involved in the war and its aftermath, and from their letters and papers, now almost a hundred years old, we learn of their anguished wartime views and their struggles afterwards either to prolong the schism in mathematics or to end it. J.C. Fields, the foremost Canadian mathematician of his time, was educated in Canada, the United States, and Germany, and championed an international spirit of cooperation to further the frontiers of mathematics. It was during the awkward post-war period that J.C. Fields established the Fields Medal, an international prize for outstanding research, which soon became the highest award in mathematics. J.C. Fields intended it to be an international medal, and a glance at the varying backgrounds of the fifty-two Fields medallists shows it to be so. Who was Fields? What carried him from Hamilton, Canada West, where he was born in 1863, into the middle of this turbulent era of international scientific politics? A modest mathematician, he was an unassuming man. This biography outlines Fields' life and times and the difficult circumstances in which he created the Fields Medal. It is the first such published study.