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Probability Sep 01 2022 The brand new edition of this classic text--with more exercises andeasier to use than ever Like the first edition, this new version ofLamperti's classic text succeeds in making this fascinating area ofmathematics accessible to readers who have limited knowledge ofmeasure theory and only some familiarity with elementaryprobability. Streamlined for even greater clarity and with moreexercises to help develop and reinforce skills, Probability isideal for graduate and advanced undergraduate students--both in andout of the classroom. Probability covers: * Probability spaces, random variables, and other fundamentalconcepts * Laws of large numbers and random series, including the Law of theIterated Logarithm * Characteristic functions, limiting distributions for sums andmaxima, and the "Central Limit Problem" * The Brownian Motion process

Mathematical Structures and Applications Jul 27 2019 This contributed volume features invited papers on current research and applications in mathematical structures. Featuring various disciplines in the mathematical sciences and physics, articles in this volume discuss fundamental scientific and mathematical concepts as well as their applications to topical problems. Special emphasis is placed on important methods, research directions and applications of analysis within and beyond each field. Covered topics include Metric operators and generalized hermiticity, Semi-frames, Hilbert-Schmidt operator, Symplectic affine action, Fractional Brownian motion, Walker Osserman metric, Nonlinear Maxwell equations, The Yukawa model, Heisenberg observables, Nonholonomic systems, neural networks, Seiberg-Witten invariants, photon-added coherent state, electrostatic double layers, and star products and functions. All contributions are from the participants of the conference held October 2016 in Cotonou, Benin in honor of Professor Mahouton Norbert Hounkonnou for his

outstanding contributions to the mathematical and physical sciences and education. Accessible to graduate students and postdoctoral researchers, this volume is a useful resource to applied scientists, applied and pure mathematicians, and mathematical and theoretical physicists.

The Ellipse Apr 03 2020 Explores the development of the ellipse and presents mathematical concepts within a rich, historical context The Ellipse features a unique, narrative approach when presenting the development of this mathematical fixture, revealing its parallels to mankind's advancement from the Counter-Reformation to the Enlightenment. Incorporating illuminating historical background and examples, the author brings together basic concepts from geometry, algebra, trigonometry, and calculus to uncover the ellipse as the shape of a planet's orbit around the sun. The book begins with a discussion that tells the story of man's pursuit of the ellipse, from Aristarchus to Newton's successful unveiling nearly two millenniums later. The narrative draws insightful similarities between mathematical developments and the advancement of the Greeks, Romans, Medieval Europe, and Renaissance Europe. The author begins each chapter by setting the historical backdrop that is pertinent to the mathematical material that is discussed, equipping readers with the knowledge to fully grasp the presented examples and derive the ellipse as the planetary pathway. All topics are presented in both historical and mathematical contexts, and additional mathematical excursions are clearly marked so that readers have a guidepost for the materials' relevance to the development of the ellipse. The Ellipse is an excellent book for courses on the history of mathematics at the undergraduate level. It is also a fascinating reference for mathematicians, engineers, or anyone with a general interest in historical mathematics.

The Mathematical Universe Dec 24 2021 Travels through mathematical concepts from Arithmetic to Zero to explore the wonders of the Fibonacci series, Russell's Paradox, and the theory of Pythagorus, in a witty and enthusiastic investigation of the great proofs, conundrums, disputes, and solutions in mathematics today.

The Mathematics of Elections and Voting Aug 08 2020 This title takes an in-depth look at the mathematics in the context of voting and electoral systems, with focus on simple ballots, complex elections, fairness, approval voting, ties, fair and unfair voting, and manipulation techniques. The exposition opens with a sketch of the mathematics behind the various methods used in conducting elections. The reader is lead to a comprehensive picture of the theoretical background of mathematics and elections through an analysis of Condorcet’s Principle and Arrow’s Theorem of conditions in electoral fairness. Further detailed discussion of various related topics include: methods of manipulating the outcome of an election, amendments, and voting on small committees. In recent years, electoral theory has been introduced into lower-level mathematics courses, as a way to illustrate the role of mathematics in our everyday life. Few books have studied voting and elections from a more formal mathematical viewpoint. This text will be useful to those who teach lower level courses or special topics courses and aims to inspire students to understand the more advanced mathematics of the topic. The exercises in this text are ideal for upper undergraduate and early graduate students, as well as those with a keen interest in the mathematics behind voting and elections.

Foundations of the Mathematical Theory of Structures Feb 23 2022

The Math Book Jan 13 2021 Learn about the most important mathematical ideas, theorems, and movements in The Math Book. Part of the fascinating Big Ideas series, this book tackles tricky topics and themes in a simple and easy to follow format. Learn about Math in this overview guide to the subject, brilliant for novices looking to find out more and experts wishing to refresh their knowledge alike! The Math Book brings a fresh and vibrant take on the topic through eye-catching graphics and diagrams to immerse yourself in. This captivating book will broaden your understanding of Math, with: - More than 85 ideas and events key to the development of mathematics - Packed with facts, charts, timelines and graphs to help explain core concepts - A visual approach to big subjects with striking illustrations and graphics throughout - Easy to follow text makes topics accessible for people at any level of understanding The Math Book is a captivating introduction to the world’s most famous theorems, mathematicians and movements, aimed at adults with an interest in the subject and students wanting to gain more of an overview. Charting the development of math around the world from Babylon to Bletchley Park, this book explains how math help us understand everything from patterns in nature to artificial intelligence. Your Math Questions, Simply Explained What is an imaginary number? Can two parallel lines ever meet? How can math help us predict the future? This engaging overview explores answers to big questions like these and how they contribute to our understanding of math. If you thought it was difficult to learn

about topics like algebra and statistics, The Math Book presents key information in an easy to follow layout. Learn about the history of math, from ancient ideas such as magic squares and the abacus to modern cryptography, fractals, and the final proof of Fermat's Last Theorem. The Big Ideas Series With millions of copies sold worldwide, The Math Book is part of the award-winning Big Ideas series from DK. The series uses striking graphics along with engaging writing, making big topics easy to understand.

Journey through Genius Jan 01 2020 Praise for William Dunham s Journey Through Genius The GreatTheorems of Mathematics "Dunham deftly guides the reader throughthe verbal and logical intricacies of major mathematical questionsand proofs, conveying a splendid sense of how the greatestmathematicians from ancient to modern times presented theirarguments." Ivars Peterson Author, The Mathematical TouristMathematics and Physics Editor, Science News "It is mathematics presented as a series of works of art; afascinating lingering over individual examples of ingenuity andinsight. It is mathematics by lightning flash." Isaac Asimov "It is a captivating collection of essays of major mathematicalachievements brought to life by the personal and historicalanecdotes which the author has skillfully woven into the text. Thisis a book which should find its place on the bookshelf of anyoneinterested in science and the scientists who create it." R. L.Graham, AT&T Bell Laboratories "Come on a time-machine tour through 2,300 years in which Dunhamdrops in on some of the greatest mathematicians in history. Almostas if we chat over tea and crumpets, we get to know them and theirideas ideas that ring with eternity and that offer glimpses intothe often veiled beauty of mathematics and logic. And all the whilewe marvel, hoping that the tour will not stop." Jearl Walker,Physics Department, Cleveland State University Author of The FlyingCircus of Physics

The Rainbow of Mathematics May 17 2021 A comprehensive and intriguing account of the evolution of arithmetic and geometry, trigonometry and algebra, explores the interconnections among mathematics, physics, and mathematical astronomy and provides a history of the discipline from a new perspective. Originally published as The Norton History of the Mathematical Sciences. Reprint.

The Adventures of Penrose, the Mathematical Cat Jul 19 2021 Penrose the cat explores and experiences a variety of mathematical concepts, including infinity, the golden rectangle, and impossible figures.

The American Mathematical Monthly Oct 22 2021

The Mathematical Experience Nov 03 2022 Traces the history of mathematics, offers profiles of major mathematicians and their discoveries, and looks at the philosophy of mathematics

The Mathematical Writings of Évariste Galois May 29 2022 Before he died at the age of twenty, shot in a mysterious early-morning duel at the end of May 1832, Evariste Galois created mathematics that changed the direction of algebra. This book contains English translations of almost all the Galois material. The translations are presented alongside a new transcription of the original French and are enhanced by three levels of commentary. An introduction explains the context of Galois' work, the various publications in which it appears, and the vagaries of his manuscripts. Then there is a chapter in which the five mathematical articles published in his lifetime are reprinted. After that come the testamentary letter and the first memoir (in which Galois expounded on the ideas that led to Galois Theory), which are the most famous of the manuscripts. These are followed by the second memoir and other lesser known manuscripts. This book makes available to a wide mathematical and historical readership some of the most exciting mathematics of the first half of the nineteenth century, presented in its original form. The primary aim is to establish a text of what Galois wrote. The details of what he did, the proper evidence of his genius, deserve to be well understood and appreciated by mathematicians as well as historians of mathematics.

Football Mar 15 2021 "Presents the mathematical concepts involved with the sport of football"--Provided by publisher.

The Mathematics of Encryption: An Elementary Introduction Jul 07 2020 How quickly can you compute the remainder when dividing by 120143? Why would you even want to compute this? And what does this have to do with cryptography? Modern cryptography lies at the intersection of mathematics and computer sciences, involving number theory, algebra, computational complexity, fast algorithms, and even quantum mechanics. Many people think of codes in terms of spies, but in the information age, highly mathematical codes are used every day by almost everyone, whether at the bank ATM, at the grocery checkout, or at the keyboard when you access your email or purchase products online. This book provides a historical and mathematical tour of cryptography, from classical ciphers to quantum cryptography. The authors introduce just enough mathematics to explore modern encryption methods, with nothing

more than basic algebra and some elementary number theory being necessary. Complete expositions are given of the classical ciphers and the attacks on them, along with a detailed description of the famous Enigma system. The public-key system RSA is described, including a complete mathematical proof that it works. Numerous related topics are covered, such as efficiencies of algorithms, detecting and correcting errors, primality testing and digital signatures. The topics and exposition are carefully chosen to highlight mathematical thinking and problem solving. Each chapter ends with a collection of problems, ranging from straightforward applications to more challenging problems that introduce advanced topics. Unlike many books in the field, this book is aimed at a general liberal arts student, but without losing mathematical completeness.

The Mathematical Theory of Finite Element Methods Jul 31 2022 This is the third and yet further updated edition of a highly regarded mathematical text. Brenner develops the basic mathematical theory of the finite element method, the most widely used technique for engineering design and analysis. Her volume formalizes basic tools that are commonly used by researchers in the field but not previously published. The book is ideal for mathematicians as well as engineers and physical scientists. It can be used for a course that provides an introduction to basic functional analysis, approximation theory, and numerical analysis, while building upon and applying basic techniques of real variable theory. This new edition is substantially updated with additional exercises throughout and new chapters on Additive Schwarz Preconditioners and Adaptive Meshes.

The Mathematical Theory of Time-Harmonic Maxwell's Equations Oct 10 2020 This book gives a concise introduction to the basic techniques needed for the theoretical analysis of the Maxwell Equations, and filters in an elegant way the essential parts, e.g., concerning the various function spaces needed to rigorously investigate the boundary integral equations and variational equations. The book arose from lectures taught by the authors over many years and can be helpful in designing graduate courses for mathematically orientated students on electromagnetic wave propagation problems. The students should have some knowledge on vector analysis (curves, surfaces, divergence theorem) and functional analysis (normed spaces, Hilbert spaces, linear and bounded operators, dual space). Written in an accessible manner, topics are first approached with simpler scale Helmholtz Equations before turning to Maxwell Equations. There are examples and exercises throughout the book. It will be useful for graduate students and researchers in applied mathematics and engineers working in the theoretical approach to electromagnetic wave propagation.

The Mathematical Mechanic Apr 27 2022 In this delightful book, Levi turns math and physics upside down, revealing how physics can simplify proofs and lead to quicker solutions and new theorems, and how physical solutions can illustrate why results are true in ways lengthy mathematical calculations never can.

Mathematics and Climate Jun 05 2020 Mathematics and Climate is a timely textbook aimed at students and researchers in mathematics and statistics who are interested in current issues of climate science, as well as at climate scientists who wish to become familiar with qualitative and quantitative methods of mathematics and statistics. The authors emphasize conceptual models that capture important aspects of Earth's climate system and present the mathematical and statistical techniques that can be applied to their analysis. Topics from climate science include the Earth?s energy balance, temperature distribution, ocean circulation patterns such as El Ni?o?Southern Oscillation, ice caps and glaciation periods, the carbon cycle, and the biological pump. Among the mathematical and statistical techniques presented in the text are dynamical systems and bifurcation theory, Fourier analysis, conservation laws, regression analysis, and extreme value theory. The following features make Mathematics and Climate a valuable teaching resource: issues of current interest in climate science and sustainability are used to introduce the student to the methods of mathematics and statistics; the mathematical sophistication increases as the book progresses and topics can thus be selected according to interest and level of knowledge; each chapter ends with a set of exercises that reinforce or enhance the material presented in the chapter and stimulate critical thinking and communication skills; and the book contains an extensive list of references to the literature, a glossary of terms for the nontechnical reader, and a detailed index.

Hockey Dec 12 2020 "Presents the mathematical concepts involved with the sport of hockey"--Provided by publisher.

Making Sense of Math Nov 10 2020 In Making Sense of Math, Cathy L. Seeley, former president of the National Council of Teachers of Mathematics, shares her insight into how to turn your students into flexible mathematical thinkers and problem solvers. This practical volume

concentrates on the following areas: * Making sense of math by fostering habits of mind that help students analyze, understand, and adapt to problems when they encounter them. * Addressing the mathematical building blocks necessary to include in effective math instruction. * Turning teaching “upside down” by shifting how we teach, focusing on discussion and analysis as much as we focus on correct answers. * Garnering support for the changes you want to make from colleagues and administrators. Learn how to make math meaningful for your students and prepare them for a lifetime of mathematical fluency and problem solving.

Mathematics and Its History Nov 22 2021 From a review of the second edition: "This book covers many interesting topics not usually covered in a present day undergraduate course, as well as certain basic topics such as the development of the calculus and the solution of polynomial equations. The fact that the topics are introduced in their historical contexts will enable students to better appreciate and understand the mathematical ideas involved...If one constructs a list of topics central to a history course, then they would closely resemble those chosen here." (David Parrott, Australian Mathematical Society) This book offers a collection of historical essays detailing a large variety of mathematical disciplines and issues; it’s accessible to a broad audience. This third edition includes new chapters on simple groups and new sections on alternating groups and the Poincare conjecture. Many more exercises have been added as well as commentary that helps place the exercises in context.

An Introduction to the Mathematical Theory of the Navier-Stokes Equations Aug 27 2019 The book provides a comprehensive, detailed and self-contained treatment of the fundamental mathematical properties of boundary-value problems related to the Navier-Stokes equations. These properties include existence, uniqueness and regularity of solutions in bounded as well as unbounded domains. Whenever the domain is unbounded, the asymptotic behavior of solutions is also investigated. This book is the new edition of the original two volume book, under the same title, published in 1994. In this new edition, the two volumes have merged into one and two more chapters on steady generalized oseen flow in exterior domains and steady Navier–Stokes flow in three-dimensional exterior domains have been added. Most of the proofs given in the previous edition were also updated. An introductory first chapter describes all relevant questions treated in the book and lists and motivates a number of significant and still open questions. It is written in an expository style so as to be accessible also to non-specialists.Each chapter is preceded by a substantial, preliminary discussion of the problems treated, along with their motivation and the strategy used to solve them. Also, each chapter ends with a section dedicated to alternative approaches and procedures, as well as historical notes. The book contains more than 400 stimulating exercises, at different levels of difficulty, that will help the junior researcher and the graduate student to gradually become accustomed with the subject. Finally, the book is endowed with a vast bibliography that includes more than 500 items. Each item brings a reference to the section of the book where it is cited. The book will be useful to researchers and graduate students in mathematics in particular mathematical fluid mechanics and differential equations. Review of First Edition, First Volume: “The emphasis of this book is on an introduction to the mathematical theory of the stationary Navier-Stokes equations. It is written in the style of a textbook and is essentially self-contained. The problems are presented clearly and in an accessible manner. Every chapter begins with a good introductory discussion of the problems considered, and ends with interesting notes on different approaches developed in the literature. Further, stimulating exercises are proposed. (Mathematical Reviews, 1995)

Companion Encyclopedia of the History and Philosophy of the Mathematical Sciences Jun 29 2022 Mathematics is one of the most basic -- and most ancient -- types of knowledge. Yet the details of its historical development remain obscure to all but a few specialists. The two-volume Companion Encyclopedia of the History and Philosophy of the Mathematical Sciences recovers this mathematical heritage, bringing together many of the world's leading historians of mathematics to examine the history and philosophy of the mathematical sciences in a cultural context, tracing their evolution from ancient times to the twentieth century. In 176 concise articles divided into twelve parts, contributors describe and analyze the variety of problems, theories, proofs, and techniques in all areas of pure and applied mathematics, including probability and statistics. This indispensable reference work demonstrates the continuing importance of mathematics and its use in physics, astronomy, engineering, computer science, philosophy, and the social sciences. Also addressed is the history of higher education in mathematics. Carefully illustrated, with annotated bibliographies of sources for each article, The Companion Encyclopedia is a valuable research tool for students and teachers in all branches of mathematics. Contents of Volume 1: Â•Ancient and Non-Western

Traditions Â•The Western Middle Ages and the Renaissance Â•Calculus and Mathematical Analysis Â•Functions, Series, and Methods in Analysis Â•Logic, Set Theories, and the Foundations of Mathematics Â•Algebras and Number Theory Contents of Volume 2: Â•Geometries and Topology Â•Mechanics and Mechanical Engineering Â•Physics, Mathematical Physics, and Electrical Engineering Â•Probability, Statistics, and the Social Sciences Â•Higher Education and Institutions Â•Mathematics and Culture Â•Select Bibliography, Chronology, Biographical Notes, and Index

Researches Into the Mathematical Principles of the Theory of Wealth, 1838 Jan 31 2020

The Mathematical Career of Pierre de Fermat, 1601-1665 Apr 15 2021 Hailed as one of the greatest mathematical results of the twentieth century, the recent proof of Fermat's Last Theorem by Andrew Wiles brought to public attention the enigmatic problem-solver Pierre de Fermat, who centuries ago stated his famous conjecture in a margin of a book, writing that he did not have enough room to show his "truly marvelous demonstration." Along with formulating this proposition--xn+yn=zn has no rational solution for n > 2--Fermat, an inventor of analytic geometry, also laid the foundations of differential and integral calculus, established, together with Pascal, the conceptual guidelines of the theory of probability, and created modern number theory. In one of the first full-length investigations of Fermat's life and work, Michael Sean Mahoney provides rare insight into the mathematical genius of a hobbyist who never sought to publish his work, yet who ranked with his contemporaries Pascal and Descartes in shaping the course of modern mathematics.

An Introduction to the Mathematical Theory of the Navier-Stokes Equations Mar 27 2022 Undoubtedly, the Navier-Stokes equations are of basic importance within the context of modern theory of partial differential equations. Although the range of their applicability to concrete problems has now been clearly recognised to be limited, as my dear friend and bright colleague K.R. Ra jagopal has showed me by several examples during the past six years, the mathematical questions that remain open are of such a fascinating and challenging nature that analysts and applied mathematicians cannot help being attracted by them and trying to contribute to their resolution. Thus, it is not a coincidence that over the past ten years more than seventy sig nificant research papers have appeared concerning the well-posedness of boundary and initial-boundary value problems. In this monograph I shall perform a systematic and up-to-date investiga tion of the fundamental properties of the Navier-Stokes equations, including existence, uniqueness, and regularity of solutions and, whenever the region of flow is unbounded, of their spatial asymptotic behavior. I shall omit other relevant topics like boundary layer theory, stability, bifurcation, de tailed analysis of the behavior for large times, and free-boundary problems, which are to be considered "advanced" ones. In this sense the present work should be regarded as "introductory" to the matter.

The Math of Life and Death Oct 02 2022 A brilliant and entertaining mathematician illuminates seven mathematical principles that shape our lives. “Kit Yates shows how our private and social lives are suffused by mathematics. Ignorance may bring tragedy or farce. This is an exquisitely interesting book. It’s a deeply serious one too and, for those like me who have little math, it’s delightfully readable.” —Ian McEwan, author of Atonement “Kit Yates is a natural storyteller. Through fascinating stories and examples, he shows how maths is the beating heart of so much of modern life. An exciting new voice in the world of science communication.” —Marcus du Sautoy, author of The Music of the Primes From birthdays to birth rates to how we perceive the passing of time, mathematical patterns shape our lives. But for those of us who left math behind in high school, the numbers and figures hurled at us as we go about our days can sometimes leave us scratching our heads and feeling as if we’re fumbling through a mathematical minefield. In this eye-opening and extraordinarily accessible book, mathematician Kit Yates illuminates hidden principles that can help us understand and navigate the chaotic and often opaque surfaces of our world. In The Math of Life and Death, Yates takes us on a fascinating tour of everyday situations and grand-scale applications of mathematical concepts, including exponential growth and decay, optimization, statistics and probability, and number systems. Along the way he reveals the mathematical undersides of controversies over DNA testing, medical screening results, and historical events such as the Chernobyl disaster and the Amanda Knox trial. Readers will finish this book with an enlightened perspective on the news, the law, medicine, and history, and will be better equipped to make personal decisions and solve problems with math in mind, whether it’s choosing the shortest checkout line at the grocery store or halting the spread of a deadly disease.

Discipline and Experience May 05 2020 Although the Scientific Revolution has long been regarded as the beginning of modern science, there has been little consensus about its true

character. While the application of mathematics to the study of the natural world has always been recognized as an important factor, the role of experiment has been less clearly understood. Peter Dear investigates the nature of the change that occurred during this period, focusing particular attention on evolving notions of experience and how these developed into the experimental work that is at the center of modern science. He examines seventeenth-century mathematical sciences—astronomy, optics, and mechanics—not as abstract ideas, but as vital enterprises that involved practices related to both experience and experiment. Dear illuminates how mathematicians and natural philosophers of the period—Mersenne, Descartes, Pascal, Barrow, Newton, Boyle, and the Jesuits—used experience in their argumentation, and how and why these approaches changed over the course of a century. Drawing on mathematical texts and works of natural philosophy from all over Europe, he describes a process of change that was gradual, halting, sometimes contradictory—far from the sharp break with intellectual tradition implied by the term "revolution."

The Mathematical Olympiad Handbook Oct 29 2019 Mathematical Olympiad competitions started in Hungary at the end of the nineteenth century, and are now held internationally. They bring together able secondary school pupils who attempt to solve problems which develop their mathematical skills. Olympiad problems are unpredictable and have noobvious starting point, and although they require only the skills learnt in ordinary school problems they can seem much harder. The Mathematical Olympiad Handbook introduces readers to these challenging problems and aims to convince them that Olympiads are not just for a select minority. The bookcontains problems from the first 32 British Mathematical Olympiad (BMO) papers 1965-96 and gives hints and outline solutions to each problem from 1975 onwards. An overview is given of the basic mathematical skills needed, and a list of books for further reading is provided. Working through theexercises provides a valuable source of extension and enrichment for all pupils and adults interested in mathematics.

Number Theory and Combinatorics Sep 08 2020 Over a career that spanned 60 years, Ronald L. Graham (known to all as Ron) made significant contributions to the fields of discrete mathematics, number theory, Ramsey theory, computational geometry, juggling and magical mathematics, and many more. Ron also was a mentor to generations of mathematicians, he gave countless talks and helped bring mathematics to a wider audience, and he held signifi cant leadership roles in the mathematical community. This volume is dedicated to the life and memory of Ron Graham, and includes 20-articles by leading scientists across a broad range of subjects that refl ect some of the many areas in which Ron worked.

Basketball Sep 20 2021 "Presents the mathematical concepts involved with the sport of basketball"--Provided by publisher.

The Mathematical Coloring Book Nov 30 2019 This book provides an exciting history of the discovery of Ramsey Theory, and contains new research along with rare photographs of the mathematicians who developed this theory, including Paul Erdös, B.L. van der Waerden, and Henry Baudet.

The Mathematical Century Jun 25 2019 The twentieth century was a time of unprecedented development in mathematics, as well as in all sciences: more theorems were proved and results found in a hundred years than in all of previous history. In The Mathematical Century, Piergiorgio Odifreddi distills this unwieldy mass of knowledge into a fascinating and authoritative overview of the subject. He concentrates on thirty highlights of pure and applied mathematics. Each tells the story of an exciting problem, from its historical origins to its modern solution, in lively prose free of technical details. Odifreddi opens by discussing the four main philosophical foundations of mathematics of the nineteenth century and ends by describing the four most important open mathematical problems of the twenty-first century. In presenting the thirty problems at the heart of the book he devotes equal attention to pure and applied mathematics, with applications ranging from physics and computer science to biology and economics. Special attention is dedicated to the famous "23 problems" outlined by David Hilbert in his address to the International Congress of Mathematicians in 1900 as a research program for the new century, and to the work of the winners of the Fields Medal, the equivalent of a Nobel prize in mathematics. This eminently readable book will be treasured not only by students and their teachers but also by all those who seek to make sense of the elusive macrocosm of twentieth-century mathematics.

JMSJ Feb 11 2021

The Simpsons and Their Mathematical Secrets Aug 20 2021 Simon Singh, author of the bestsellers Fermat's Enigma, The Code Book, and Big Bang, offers fascinating new insights into the celebrated television series The Simpsons: That the show drip-feeds morsels of number theory into the minds of its viewers—indeed, that there are so many mathematical

references in the show, and in its sister program, Futurama, that they could form the basis of an entire university course. Recounting memorable episodes from “Bart the Genius” to “Homer3,” Singh brings alive intriguing and meaningful mathematical concepts—ranging from the mathematics of pi and the paradox of infinity to the origin of numbers and the most profound outstanding problems that haunt today's generation of mathematicians. In the process, he illuminates key moments in the history of mathematics, and introduces us to The Simpsons' brilliant writing team—the likes of David X. Cohen, Al Jean, Jeff Westbrook, and Stewart Burns—all of whom have various advanced degrees in mathematics, physics, and other sciences. Based on interviews with the writers of The Simpsons and replete with images from the shows, facsimiles of scripts, paintings and drawings, and other imagery, The Simpsons and Their Mathematical Secrets will give anyone who reads it an entirely new insight into the most successful show in television history.

Mathematics of Public Health Jun 17 2021 Curated by the Fields Institute for Research in Mathematical Sciences from their COVID-19 Math Modelling Seminars, this first in a series of volumes on the mathematics of public health allows readers to access the dominant ideas and techniques being used in this area, while indicating problems for further research. This work brings together experts in mathematical modelling from across Canada and the world, presenting the latest modelling methods as they relate to the COVID-19 pandemic. A primary aim of this book is to make the content accessible so that researchers share the core methods that may be applied elsewhere. The mathematical theories and technologies in this book can be used to support decision makers on critical issues such as projecting outbreak trajectories, evaluating public health interventions for infection prevention and control, developing optimal strategies to return to a new normal, and designing vaccine candidates and informing mass immunization program. Topical coverage includes: basic susceptible-exposed-infectious-recovered (SEIR) modelling framework modified and applied to COVID-19 disease transmission dynamics; nearcasting and forecasting for needs of critical medical resources including personal protective equipment (PPE); predicting COVID-19 mortality; evaluating effectiveness of convalescent plasma treatment and the logistic implementation challenges; estimating impact of delays in contact tracing; quantifying heterogeneity in contact mixing and its evaluation with social distancing; modelling point of care diagnostics of COVID-19; and understanding non-reporting and underestimation. Further, readers will have the opportunity to learn about current modelling methodologies and technologies for emerging infectious disease outbreaks, pandemic mitigation rapid response, and the mathematics behind them. The volume will help the general audience and experts to better understand the important role that mathematics has been playing during this on-going crisis in supporting critical decision-making by governments and public health agencies.

Mathematics for the Nonmathematician Sep 28 2019 Practical, scientific, philosophical, and artistic problems have caused men to investigate mathematics. But there is one other motive which is as strong as any of these — the search for beauty. Mathematics is an art, and as such affords the pleasures which all the arts afford." In this erudite, entertaining college-level text, Morris Kline, Professor Emeritus of Mathematics at New York University, provides the liberal arts student with a detailed treatment of mathematics in a cultural and historical context. The book can also act as a self-study vehicle for advanced high school students and laymen. Professor Kline begins with an overview, tracing the development of mathematics to the ancient Greeks, and following its evolution through the Middle Ages and the Renaissance to the present day. Subsequent chapters focus on specific subject areas, such as "Logic and Mathematics," "Number: The Fundamental Concept," "Parametric Equations and Curvilinear Motion," "The Differential Calculus," and "The Theory of Probability." Each of these sections offers a step-by-step explanation of concepts and then tests the student's understanding with exercises and problems. At the same time, these concepts are linked to pure and applied science, engineering, philosophy, the social sciences or even the arts. In one section, Professor Kline discusses non-Euclidean geometry, ranking it with evolution as one of the "two concepts which have most profoundly revolutionized our intellectual development since the nineteenth century." His lucid treatment of this difficult subject starts in the 1800s with the pioneering work of Gauss, Lobachevsky, Bolyai and Riemann, and moves forward to the theory of relativity, explaining the mathematical, scientific and philosophical aspects of this pivotal breakthrough. Mathematics for the Nonmathematician exemplifies Morris Kline's rare ability to simplify complex subjects for the nonspecialist.

The Mathematical Universe Jan 25 2022 I first had a quick look, then I started reading it. I couldn't stop. -Gerard 't Hooft (Nobel Prize, in Physics 1999) This is a book about the mathematical nature of our Universe. Armed with no more than basic high school mathematics,

Dr. Joel L. Schiff takes you on a foray through some of the most intriguing aspects of the world around us. Along the way, you will visit the bizarre world of subatomic particles, honey bees and ants, galaxies, black holes, infinity, and more. Included are such goodies as measuring the speed of light with your microwave oven, determining the size of the Earth with a stick in the ground and the age of the Solar System from meteorites, understanding how the Theory of Relativity makes your everyday GPS system possible, and so much more. These topics are easily accessible to anyone who has ever brushed up against the Pythagorean Theorem and the symbol ?, with the lightest dusting of algebra. Through this book, science-curious readers will come to appreciate the patterns, seeming contradictions, and extraordinary mathematical beauty of our Universe.

A First Course in the Mathematical Foundations of Thermodynamics Mar 03 2020 Research in the past thirty years on the foundations of thermodynamics has led not only to a better understanding of the early developments of the subject but also to formulations of the First and Second Laws that permit both a rigorous analysis of the consequences of these laws and a substantial broadening of the class of systems to which the laws can fruitfully be applied. Moreover, modem formulations of the laws of thermodynamics have now achieved logically parallel forms at a level accessible to under graduate students in science and engineering who have completed the standard calculus sequence and who wish to understand the role which mathematics can play in scientific inquiry. My goal in writing this book is to make some of the modem develop ments in thermodyamics available to readers with the background and orientation just mentioned and to present this material in the form of a text suitable for a one-semester junior-level course. Most of this presentation is taken from notes that I assembled while teaching such a course on two occasions. I found that, aside from a brief review of line integrals and exact differentials in two dimensions and a short discussion of infima and suprema of sets of real numbers, juniors (and even some mature sophomores) had sufficient mathematical background to handle the subject matter. Many of the students whom I taught had very limited experience with formal and rigorous mathematical exposition.