Great Moments In Mathematics After 1650

In 1845 a blight of unknown origin destroyed the potato crop in Ireland triggering a series of events that would change forever the course of Ireland's history. The British government called the famine an act of God. The Irish called it genocide. By any name the famine caused the death of over one million men, women, and children by starvation and disease. Another two million were forced to flee the country. With the famine as a backdrop, this is a story about two families as different as coarse wool and fine silk. Michael Ranahan, the son of a tenant farmer, dreams of breaking his bondage to the land and going to America. The passage money has been saved. He's made up his mind to go. And then-the blight strikes and Michael must put his dream on hold. The landlord, Lord Somerville, is a compassionate man who struggles to preserve a way of life without compromising his ideals. To add to his troubles, he has to deal with a recalcitrant daughter who chafes at being forced to live in a country of "bog runners."In The Time Of Famine is a story of survival. It's a story of duplicity. But most of all, it's a story of love and sacrifice.

Perspectives in Computation covers three broad topics: the computation process & its limitations; the search for computational efficiency; & the role of quantum mechanics in computation.

What a splendid addition this is to the Dolciani Mathematical Exposition series! This second set of lectures on great moments in mathematics (after 1650) is a fascinating collection of pivotal points in the historical development of mathematics...The four lectures devoted to the liberation of geometry and algebra are of particular interest. The lectures should be required reading for all teachers of mathematics. —Herbert Fremont, The Mathematics Teacher Eves is never less than tantalizing and usually inspiring...each 'great moment' has detailed exercises following it, as these have been carefully chosen to illustrate the depth of the ideas in question. —C. W. Kilmister, The London Times, Higher Education Supplement As is usual with Eves' work, the books are well written and entertaining. They give an historical background to many of the best known mathematical results, and, in addition, provide interesting pieces of information about the mathematicians involved. Eves includes relevant exercises at the end of each chapter. These are a good source of different, interesting problems, and when combined with the material in the chapter, could form the basis for a mathematical project...Eves' book provides an interesting, well-written, and enjoyable account. You won't be disappointed. —David Parrott, The Australian Mathematics Teacher

Rethinking Randomness

Mathematical Plums

Perspectives in Computation

A New Foundation for Stochastic Modeling

Graph. Darst. - (..., 7)

This book shows that it is possible to provide a fully rigorous treatment of calculus for those planning a career in an area that uses mathematics regularly (e.g., statistics, mathematics, economics, finance, engineering, etc.). It reveals to students on the ways to approach and understand mathematics. It covers efficiently and rigorously the differential and integral calculus, and its foundations in mathematical analysis. It also aims at a comprehensive, efficient, and rigorous treatment by introducing all the concepts succinctly. Experience has shown that this approach, which treats understanding on par with technical ability, has long term benefits for students.

The book records the essential discoveries of mathematical and computational scientists in chronological order, following the birth of ideas on the basis of prior ideas ad infinitum. The authors document the winding path of mathematical scholarship throughout history, and most importantly, the thought process of each individual that resulted in the mastery of their subject. The book implicitly addresses the nature and character of every scientist as one tries to understand their visible actions in both adverse and congenial environments. The authors hope that this will enable the reader to understand their mode of thinking, and perhaps even to emulate their virtues in life.

Mathematical models based on stochastic processes have proven surprisingly accurate in many situations where their underlying assumptions are unlikely to be correct. Rethinking Randomness introduces an alternative characterization of randomness and a new modeling framework that together explain the improbable success of these probabilistic models. The new approach, known as observational stochastics, is derived from "back of the envelope" methods employed routinely by engineers, experimental scientists and systems oriented practitioners working in many fields. By formalizing and extending these intuitive techniques, observational stochastics provides an entirely rigorous alternative to traditional mathematical theory that leads to vastly simpler derivations of certain major results and a deeper understanding of their true significance. Students who encounter probabilistic models in their courses in the physical, social and system sciences should find this book particularly helpful in understanding how the material they are studying in class is actually applied in practice. And because all mathematical arguments are self-contained and relatively straightforward, technically oriented non-specialists who wish to explore the connection between probability theory and the physical world should find most of the material in this book readily accessible. Most chapters are structured around a series of examples, beginning with the simplest possible cases and then extending the analysis in multiple directions. Powerful generalized results are presented only after simpler cases have been introduced and explained thoroughly. Readers who choose to bypass the mathematically complex sections of this book can still use these simpler examples to obtain a clear understanding of the basic principles involved. The most extensive series of examples appear in Chapter 7, which incorporates a "mini course" on queuing theory and its applications to Computer Science. The author's first hand accounts of early developments in this area lend Rethinking Randomness a unique flavor. Chapter 8 examines the implications of observational stochastics for the debate between Bayesians and frequentists regarding the true meaning of "probability." Once again, the discussion is centered on a series of simple and highly approachable examples, leading ultimately to an interpretation of probability that is aligned most closely with the view of the great French mathematician Poincare (1854-1912). This proportionalist interpretation of chance then provides the foundation for the intuitive discussions of the Law of Large Numbers and the Ergodic Theorem that appear in Chapter 9. Advanced students and researchers will recognize that observational stochastics has the potential to be extended in many directions that are largely unexplored. These include the use of shaped simulation to improve the speed and accuracy of Monte Carlo simulations, the development of new error bounds for cases where assumptions of empirical independence are not satisfied exactly, and the investigation of mathematical properties of special formal structures known as t-loops. Extensions required to deal with transient and trans-distributional aspects of observable behavior may also be feasible, but represent a substantially more difficult undertaking for researchers who wish to take up the challenge."

The Foundations of Mathematics

The Virginia Mathematics Teacher

The Nature of Negative Numbers

Great Moments in Mathematics: After 1650

Great Moments in Mathematics: After 1650American Mathematical Soc.

Presents a series of lectures on the history of mathematics covering such topics as the Pythagorean Theorem, Archimedes, and Fibonacci.

Biographies of 23 important mathematicians span many centuries and cultures. Historical Learning Tasks provide 21 in-depth treatments of a variety of historical problems.

Mathematics Frontiers

Great Moments in Mathematics After 1650

The American Mathematical Monthly

Handbook of Discrete and Combinatorial Mathematics

Learning Activities from the History of Mathematics

During the first half of the 20th century, mathematics became an international discipline that led to major advances in science and technology. Modern Mathematics: 1900 to 1950 provides an eye-opening introduction to those five historic decades by analyzing the advancement of the field through the accomplishments of 10 significant mathematicians. From David Hilbert and Emmy Noether, who introduced the infinite dimensional vector spaces and algebraic rings that bear their names, to Norbert Wiener, the founder of cybernetics, this in-depth volume is an excellent choice for libraries aiming to provide a range of resources covering the history of mathematics.

Great Moments in Mathematics: Before 1650 is the product of a series of lectures on the history of mathematics given by Howard Eves. He presents here, in chronological order, 20 ``great moments in mathematics before 1650'', which can be appreciated by anyone who enjoys mathematics. These wonderful lectures could be used as the basis of a course on the history of mathematics but can also serve as enrichment to any mathematics course. Included are lectures on the Pythagorean Theorem, Euclid's Elements, Archimedes (on the sphere), Diophantus, Omar Khayyam, and Fibonacci.

Tracing the development of mathematics from a biographical standpoint, Mathematics Frontiers: 1950 to the Present profiles innovators from the second half of the 20th century who made significant discoveries in both pure and applied mathematics. From John H. Conway, who helped complete the classification of all finite groups (and invented The Game of Life board game), to Stephen Hawking, who established the mathematical basis for black holes, to Fan Chung, who developed an encoding and decoding algorithm for cell phone calls, this lively survey of contemporary minds behind the math is ideal for middle and high school students seeking resources for research or general interest.

In the Time of Famine

Mathematics Magazine

1800 to 1900

1950 to Present

A Novel

NATIONAL BESTSELLER • A stunning “portrait of the enduring grace of friendship” (NPR) about the families we are born into, and those that we make for ourselves. A masterful depiction of love in the twenty-first century. A NATIONAL BOOK AWARD FINALIST • A MAN BOOKER PRIZE FINALIST • WINNER OF THE KIRKUS PRIZE A Little Life follows four college classmates—broke, adrift, and buoyed only by their friendship and ambition—as they move to New York in search of fame and fortune. While their relationships, which are tinged by addiction, success, and pride, deepen over the decades, the men are held together by their devotion to the brilliant, enigmatic Jude, a man scarred by an unspeakable childhood trauma. A hymn to brotherly bonds and a masterful depiction of love in the twenty-first century, Hanya Yanagihara’s stunning novel is about the families we are born into, and those that we make for ourselves. Look for Hanya Yanagihara’s new novel, To Paradise, coming in January 2022.

Like masterpieces of art, music, and literature, great mathematical theorems are creative milestones, works of genius destined to last forever. Now William Dunham gives them the attention they deserve. Dunham places each theorem within its historical context and explores the very human and often turbulent life of the creator — from Archimedes, the absentminded theoretician whose absorption in his work often precluded eating or bathing, to Gerolamo Cardano, the sixteenth-century mathematician whose accomplishments flourished despite a bizarre array of misadventures, to the paranoid genius of modern times, Georg Cantor. He also provides step-by-step proofs for the theorems, each easily accessible to readers with no more than a knowledge of high school mathematics. A rare combination of the historical, biographical, and mathematical, Journey Through Genius is a fascinating introduction to a neglected field of human creativity. “It is mathematics presented as a series of works of art; a fascinating lingering over individual examples of ingenuity and insight. It is mathematics by lightning flash.” —Isaac Asimov

In the world of mathematics, it is always important to keep growing in knowledge, in pursuit of answers and in confirming findings more accurately. That characterizes the endeavor of author Peter Erickson through his new book, The Nature of Negative Numbers, which explores negativity in mathematics. Peter's chief focus is on number systems, between the real number system and the veritable number system. He begins the book's discussion with the history of the law of signs, given to us by Greek mathematician Diophantus. The narration explores further the two mathematical systems, real vs. veritable: journeying into points about negative roots and powers, significance of signs in addition and subtraction and even how the systems measure up to the basic laws of arithmetic. Sir William Rowan Hamilton is also shared within The Nature of Negative Numbers, as Peter states what mathematician Sir William learned during his own experiments with the systems.

Mathematical Diamonds

Great moments in mathematics (after 1650)

Analysis: A Gateway To Understanding Mathematics

After 1650

Great Moments In Mathematics Notebook

This book comprises five parts. The first three contain ten historical essays on important topics: number theory, calculus/analysis, and proof, respectively. Part four deals with several historically oriented courses, and Part five provides biographies of five mathematicians who played major roles in the historical events described in the first four parts of the work. Excursions in the History of Mathematics was written with several goals in mind: to arouse mathematics teachers' interest in the history of their subject; to encourage mathematics teachers with at least some knowledge of the history of mathematics to offer courses with a strong historical component; and to provide an historical perspective on a number of basic topics taught in mathematics courses.

Looks at the history of mathematical discoveries and the lives of great mathematicians.

The new emphasis in the Singapore mathematics education is on Big Ideas (Charles, 2005). This book contains more than 15 chapters from various experts on mathematics education that describe various aspects of Big Ideas from theory to practice. It contains chapters that discuss the historical development of mathematical concepts, specific mathematical concepts in relation to Big Ideas in mathematics, the spirit of Big Ideas in mathematics and its enactment in the mathematics classroom.This book presents a wide spectrum of issues related to Big Ideas in mathematics education. On the one end, we have topics that are mathematics content related, those that discuss the underlying principles of Big Ideas, and others that deepen the readers' knowledge in this area, and on the other hand there are practice oriented papers in preparing practitioners to have a clearer picture of classroom enactment related to an emphasis on Big Ideas.

Creators of Mathematical and Computational Sciences

A Transition

Journey Through Genius

Modern Mathematics

Mathematics for Machine Learning

One of The New York Times Book Review’s “10 Best Books of 2021” Shortlisted for the 2021 International Booker Prize A fictional examination of the lives of real-life scientists and thinkers whose discoveries resulted in moral consequences beyond their imagining. When We Cease to Understand the World is a book about the complicated links between scientific and mathematical discovery, madness, and destruction. Fritz Haber, Alexander Grothendieck, Werner Heisenberg, Erwin Schrödinger—these are some of luminaries into whose troubled lives Benjamín Labatut thrusts the reader, showing us how they grappled with the most profound questions of existence. They have strokes of unparalleled genius, alienate friends and lovers, descend into isolation and insanity. Some of their discoveries reshape human life for the better; others pave the way to chaos and unimaginable suffering. The lines are never clear. At a breakneck pace and with a wealth of disturbing detail, Labatut uses the imaginative resources of fiction to tell the stories of the scientists and mathematicians who expanded our notions of the possible.

The fundamental mathematical tools needed to understand machine learning include linear algebra, analytic geometry, matrix decompositions, vector calculus, optimization, probability and statistics. These topics are traditionally taught in disparate courses, making it hard for data science or computer science students, or professionals, to efficiently learn the mathematics. This self-contained textbook bridges the gap between mathematical and machine learning texts, introducing the mathematical concepts with a minimum of prerequisites. It uses these concepts to derive four central machine learning methods: linear regression, principal component analysis, Gaussian mixture models and support vector machines. For students and others with a mathematical background, these derivations provide a starting point to machine learning texts. For those learning the mathematics for the first time, the methods help build intuition and practical experience with applying mathematical concepts. Every chapter includes worked examples and exercises to test understanding. Programming tutorials are offered on the book's web site.

During the 16th and 17th centuries, mathematicians developed a wealth of new ideas but had not carefully employed accurate definitions, proofs, or procedures to document and implement them. However, in the early 19th century, mathematicians began to recognize the need to precisely define their terms, to logically prove even obvious principles, and to use rigorous methods of manipulation. The Foundations of Mathematics presents the lives and accomplishments of 10 mathematicians who lived between CE 1800 and 1900 and contributed to one or more of the four major initiatives that characterized the rapid growth of mathematics during the 19th century: the introduction of rigor, the investigation of the structure of mathematical systems, the development of new branches of mathematics, and the spread of mathematical activity throughout Europe. This readable new volume communicates the importance and impact of the work of the pioneers who redefined this area of study.

Moments in Mathematics

When We Cease to Understand the World

Excursions in the History of Mathematics

Great Moments in Mathematics Before 1650

The Great Theorems of Mathematics

Function theory, spectral decomposition of operators, probability, approximation, electrical and mechanical inverse problems, prediction of stochastic processes, the design of algorithms for signal-processing VLSI chips--these are among a host of important theoretical and applied topics illuminated by the classical moment problem. To survey some of these ramifications and the research which derives from them, the AMS sponsored the Short Course Moments in Mathematics at the Joint Mathematics Meetings, held in San Antonio, Texas, in January 1987. This volume contains the six lectures presented during that course. The papers are likely to find a wide audience, for they are expository, but nevertheless lead the reader to topics of current research. In his paper, Henry J. Landau sketches the main ideas of past work related to the moment problem by such mathematicians as Caratheodory, Herglotz, Schur, Riesz, and Krein and describes the way the moment problem has interconnected so many diverse areas of research. J. H. B. Kemperman examines the moment problem from a geometric viewpoint which involves a certain natural duality method and leads to interesting applications in linear programming, measure theory, and dilations. Donald Sarason first provides a brief review of the theory of unbounded self-adjoint operators then goes on to sketch the operator-theoretic treatment of the Hamburger problem and to discuss Hankel operators, the Adamjan-Arov-Krein approach, and the theory of unitary dilations. Exploring the interplay of trigonometric moment problems and signal processing, Thomas Kailath describes the role of Szego polynomials in linear predictive coding methods, parallel implementation, one-dimensional inverse scattering problems, and the Toeplitz moment matrices. Christian Berg contrasts the multi-dimensional moment problem with the one-dimensional theory and shows how the theory of the moment problem may be viewed as part of harmonic analysis on semigroups. Starting from a historical survey of the use of moments in probability and statistics, Persi Diaconis illustrates the continuing vitality of these methods in a variety of recent novel problems drawn from such areas as Wiener-Ito integrals, random graphs and matrices, Gibbs ensembles, cumulants and self-similar processes, projections of high-dimensional data, and empirical estimation.

The importance of discrete and combinatorial mathematics continues to increase as the range of applications to computer science, electrical engineering, and the biological sciences grows dramatically. Providing a ready reference for practitioners in the field, the Handbook of Discrete and Combinatorial Mathematics, Second Edition presents additional material on Google's matrix,

random graphs, geometric graphs, computational topology, and other key topics. New chapters highlight essential background information on bioinformatics and computational geometry. Each chapter includes a glossary, definitions, facts, examples, algorithms, major applications, and references.
Shows How to Read & Write Mathematical Proofs Ideal Foundation for More Advanced Mathematics Courses Introduction to Mathematical Proofs: A Transition facilitates a smooth transition from courses designed to develop computational skills and problem solving abilities to courses that emphasize theorem proving. It helps students develop the skills necessary to write clear, correct, and concise proofs. Unlike similar textbooks, this one begins with logic since it is the underlying language of mathematics and the basis of reasoned arguments. The text then discusses deductive mathematical systems and the systems of natural numbers, integers, rational numbers, and real numbers. It also covers elementary topics in set theory, explores various properties of relations and functions, and proves several theorems using induction. The final chapters introduce the concept of cardinalities of sets and the concepts and proofs of real analysis and group theory. In the appendix, the author includes some basic guidelines to follow when writing proofs. Written in a conversational style, yet maintaining the proper level of mathematical rigor, this accessible book teaches students to reason logically, read proofs critically, and write valid mathematical proofs. It will prepare them to succeed in more advanced mathematics courses, such as abstract algebra and geometry.
A Little Life
Stories from the Lives of Great Mathematicians
Mathematicians are People, Too
The Journal of the Virginia Council of Teachers of Mathematics
Crux Mathematicorum

A collection of interesting problems in the fields of number theory, combinatorics, and geometry.
Ross Honsberger has done it again. He has brought together another wonderful collection of elementary mathematical problems and their solutions abounding in striking surprises and brilliant ideas that reflect the beauty of mathematics. Many of these problems come from mathematical journals. Others come from various mathematical competitions such as the Tournament of the Towns, the Balkan Olympiad, the American Invitational Mathematics Exam, and the Putnam exam. And, of course, there is a problem suggested by Paul Erdös. This book is ideal for students, teachers and anyone interested in recreational mathematics.
(before 1650)
Mathematical Morsels
Big Ideas In Mathematics: Yearbook 2019, Association Of Mathematics Educators
Great Moments in Mathematics (before 1650)
Great Moments in Mathematics