Journey Through Genius The Great Theorems Of Mathematics By William Dunham Summary Study Guide

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Great Feuds in Mathematics - Hal Hellman 2006-09-01
Praise for Hal Hellman Great Feuds in Mathematics ""Those who think that mathematicians are cold, mechanical proving machines will do well to read Hellman's book on conflicts in mathematics. The main characters are as excitable and touchy as the next man. But Hellman's stories also show how scientific fights bring out sharper formulations and better arguments."" -Professor Dirk van Dalen, Philosophy Department, Utrecht University Great Feuds in Technology ""There's nothing like a good feud to grab your attention. And when it comes to describing the battle, Hal Hellman is a master."" -New Scientist Great Feuds in Science ""Unusual insight into the development of science . . . I was excited by this book and enthusiastically recommend it to general as well as scientific audiences."" -American Scientist ""Hellman has assembled a series of entertaining tales . . . many fine examples of heady invective without parallel in our time."" -Nature Great Feuds in Medicine ""This engaging book documents [the] reactions in ten of the most heated controversies and rivalries in medical history. . . . The disputes detailed are . . . fascinating. . . . It is delicious stuff here."" -The New York Times ""Stimulating."" -Journal of the American Medical Association

Journey Through Genius - William Dunham 1991-08
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

Real Analysis - Frank Morgan 2005

Real Analysis builds the theory behind calculus directly from the basic concepts of real numbers, limits, and open and closed sets in $\mathbb{R}^n$. It gives the three characterizations of continuity: via epsilon-delta, sequences, and open sets. It gives the three characterizations of compactness: as ``closed and bounded,'' via sequences, and via open covers. Topics include Fourier series, the Gamma function, metric spaces, and Ascoli's Theorem. The text not only provides efficient proofs, but also shows the student how to come up with them. The excellent exercises come with select solutions in the back. Here is a real analysis text that is short enough for the student to read and understand and complete enough to be the primary text for a serious undergraduate course. Frank Morgan is the author of five books and over one hundred articles on mathematics. He is an inaugural recipient of the Mathematical Association of America's national Haimo award for excellence in teaching. With this book, Morgan has finally brought his famous direct style to an undergraduate real analysis text.

A Concept of Limits - Donald W. Hight 2012-07-17

An exploration of conceptual foundations and the practical applications of limits in mathematics, this text offers a concise introduction to the theoretical study of calculus. Many exercises with solutions. 1966 edition.

The Mathematician's Mind - Jacques Hadamard 2020-05-05

Fifty years ago when Jacques Hadamard set out to explore how mathematicians invent new ideas, he considered the creative experiences of some of the greatest thinkers of his generation, such as George Polya, Claude Lévi-Strauss, and Albert Einstein. It appeared that inspiration could strike anytime, particularly after an individual had worked hard on a problem for days and then turned attention to another activity. In exploring this phenomenon, Hadamard produced one of the most famous and cogent cases for the existence of unconscious mental processes in mathematical invention and other forms of creativity. Written before the explosion of research in computers and cognitive science, his book, originally titled The Psychology of Invention in the Mathematical Field, remains an important tool for exploring the increasingly complex problem of mental life. The roots of creativity for Hadamard lie not in consciousness, but in the long unconscious work of incubation, and in the unconscious aesthetic selection of ideas that thereby pass into consciousness. His discussion of this process comprises a wide range of topics, including the use of mental images or symbols, visualized or auditory words, "meaningless" words, logic, and intuition. Among the important documents collected is a letter from Albert Einstein analyzing his own mechanism of thought.

Mathematics - Keith J. Devlin 1999

Mathematics: The New Golden Age offers a glimpse of the extraordinary vistas and bizarre universes opened up by contemporary mathematicians: Hilbert's tenth problem and the four-color theorem, Gaussian integers, chaotic dynamics and the Mandelbrot set, infinite numbers, and strange number systems. Why a "new golden age"? According to Keith Devlin, we are currently witnessing an astronomical amount of mathematical research. Charting the most significant developments that have taken place in mathematics since 1960, Devlin expertly describes these advances for the interested layperson and adroitly summarizes their significance as he leads the reader into the heart of the most interesting mathematical perplexities -- from the biggest known prime number to the Shimura-Taniyama conjecture for Fermat's Last Theorem. Revised and updated to take into account dramatic developments of the 1980s and 1990s, Mathematics: The New Golden Age includes, in addition to Fermat's Last Theorem, major new sections on knots and topology, and the mathematics of the physical universe. Devlin portrays mathematics not as a collection of procedures for solving problems, but as a unified part of human culture, as part of mankind's eternal quest to understand ourselves and the world in which we live. Though a genuine science, mathematics has strong artistic elements as well; this creativity is in evidence here as Devlin shows what mathematicians do -- and reveals that it has little to do with numbers and arithmetic. This book brilliantly captures the fascinating new age of

mathematics.

Godel - John L. Casti 2009-04-21

Kurt Gödel was an intellectual giant. His Incompleteness Theorem turned not only mathematics but also the whole world of science and philosophy on its head. Shattering hopes that logic would, in the end, allow us a complete understanding of the universe, Gödel's theorem also raised many provocative questions: What are the limits of rational thought? Can we ever fully understand the machines we build? Or the inner workings of our own minds? How should mathematicians proceed in the absence of complete certainty about their results? Equally legendary were Gödel's eccentricities, his close friendship with Albert Einstein, and his paranoid fear of germs that eventually led to his death from self-starvation. Now, in the first book for a general audience on this strange and brilliant thinker, John Casti and Werner DePauli bring the legend to life.

Numbers and Infinity - E. H. Sondheimer 2006-01-01

This fresh overview of numbers and infinity avoids tedium and controversy while maintaining historical accuracy and modern relevance. Perfect for undergraduate mathematics or science history courses. 1981 edition.

The Equation that Couldn't Be Solved - Mario Livio 2005-09-19

What do Bach's compositions, Rubik's Cube, the way we choose our mates, and the physics of subatomic particles have in common? All are governed by the laws of symmetry, which elegantly unify scientific and artistic principles. Yet the mathematical language of symmetry-known as group theory-did not emerge from the study of symmetry at all, but from an equation that couldn't be solved. For thousands of years mathematicians solved progressively more difficult algebraic equations, until they encountered the quintic equation, which resisted solution for three centuries. Working independently, two great prodigies ultimately proved that the quintic cannot be solved by a simple formula. These geniuses, a Norwegian named Niels Henrik Abel and a romantic Frenchman named Évariste Galois, both died tragically young. Their incredible labor, however, produced the origins of group theory. The first extensive, popular account of the mathematics of symmetry and order, The Equation That Couldn't Be Solved is told not through abstract formulas but in a beautifully written and dramatic account of the lives and work of some of the greatest and most intriguing mathematicians in history.

Gödel, Escher, Bach - Douglas R. Hofstadter 2000

'What is a self and how can a self come out of inanimate matter?' This is the riddle that drove Douglas Hofstadter to write this extraordinary book. In order to impart his original and personal view on the core mystery of human existence - our intangible sensation of 'I'-ness - Hofstadter defines the playful yet seemingly paradoxical notion of 'strange loop', and explicates this idea using analogies from many disciplines.

The Creativity Code - Marcus Du Sautoy 2020-03-03

“A brilliant travel guide to the coming world of AI.” —Jeanette Winterson What does it mean to be creative? Can creativity be trained? Is it uniquely human, or could AI be considered creative? Mathematical genius and exuberant polymath Marcus du Sautoy plunges us into the world of artificial intelligence and algorithmic learning in this essential guide to the future of creativity. He considers the role of pattern and imitation in the creative process and sets out to investigate the programs and programmers—from Deep Mind and the Flow Machine to Botnik and WHIM—who are seeking to rival or surpass human innovation in gaming, music, art, and language. A thrilling tour of the landscape of invention, The Creativity Code explores the new face of creativity and the mysteries of the human code. “As machines outsmart us in ever more domains, we can at least comfort ourselves that one area will remain sacrosanct and uncomputable: human creativity. Or can we?...In his fascinating exploration of the nature of creativity, Marcus du Sautoy questions many of those assumptions.” —Financial Times “Fascinating...If all the experiences, hopes, dreams, visions, lusts, loves, and hatreds that shape the human imagination amount to nothing more than a ‘code,’ then sooner or later a machine will crack it. Indeed, du Sautoy assembles an eclectic array of evidence to show how that’s happening even now.” —The Times

Math through the Ages: A Gentle History for Teachers and Others Expanded Second Edition - William P. Berlinghoff 2021-04-29
Where did math come from? Who thought up all those algebra symbols, and why? What is the story behind π π? ... negative numbers? ... the metric system? ... quadratic equations? ... sine and cosine? ... logs? The 30 independent historical sketches in Math through the Ages answer these questions and many others in an informal, easygoing style that is accessible to teachers, students, and anyone who is curious about the history of mathematical ideas. Each sketch includes Questions and Projects to help you learn more about its topic and to see how the main ideas fit into the bigger picture of history. The 30 short stories are preceded by a 58-page bird's-eye overview of the entire panorama of mathematical history, a whirlwind tour of the most important people, events, and trends that shaped the mathematics we know today. “What to Read Next” and reading suggestions after each sketch provide starting points for readers who want to learn more. This book is ideal for a broad spectrum of audiences, including students in history of mathematics courses at the late high school or early college level, pre-service and in-service teachers, and anyone who just wants to know a little more about the origins of mathematics.

Against the Gods - Peter L. Bernstein 2012-09-11
A Business Week, New York Times Business, and USA Today Bestseller "Ambitious and readable . . . an engaging introduction to the oddsmakers, whom Bernstein regards as true humanists helping to release mankind from the choke holds of superstition and fatalism." —The New York Times "An extraordinarily entertaining and informative book." —The Wall Street Journal "A lively panoramic book . . . Against the Gods sets up an ambitious premise and then delivers on it." —Business Week "Deserves to be, and surely will be, widely read." —The Economist "[A] challenging book, one that may change forever the way people think about the world." —Worth "No one else could have written a book of such central importance with so much charm and excitement." —Robert Heilbroner author, The Worldly Philosophers "With his wonderful knowledge of the history and current manifestations of risk, Peter Bernstein brings us Against the Gods. Nothing like it will come out of the financial world this year or ever. I speak carefully: no one should miss it." —John Kenneth Galbraith Professor of Economics Emeritus, Harvard University In this unique exploration of the role of risk in our society, Peter Bernstein argues that the notion of bringing risk under control is one of the central ideas that distinguishes modern times from the distant past. Against the Gods chronicles the remarkable intellectual adventure that liberated humanity from oracles and soothsayers by means of the powerful tools of risk management that are available to us today. "An extremely readable history of risk." —Barron's "Fascinating . . . this challenging volume will help you understand the uncertainties that every investor must face." —Money "A singular achievement." —Times Literary Supplement "There's a growing market for savants who can render the recondite intelligibly-witness Stephen Jay Gould (natural history), Oliver Sacks (disease), Richard Dawkins (heredity), James Gleick (physics), Paul Krugman (economics)-and Bernstein would mingle well in their company." —The Australian

Prelude to Mathematics - W. W. Sawyer 2012-04-19
This lively, stimulating account of non-Euclidean geometry by a noted mathematician covers matrices, determinants, group theory, and many other related topics, with an emphasis on the subject's novel, striking aspects. 1955 edition.

Errors, Blunders, and Lies - David S. Salsburg 2017-05-18
We live in a world that is not quite "right." The central tenet of statistical inquiry is that Observation = Truth + Error because even the most careful of scientific investigations have always been bedeviled by uncertainty. Our attempts to measure things are plagued with small errors. Our attempts to understand our world are blocked by blunders. And, unfortunately, in some cases, people have been known to lie. In this long-awaited follow-up to his well-regarded bestseller, The Lady Tasting Tea, David Salsburg opens a door to the amazing widespread use of statistical methods by looking at historical examples of errors, blunders and lies from areas as diverse as archeology, law, economics, medicine, psychology, sociology, Biblical studies, history, and war-time espionage.

In doing so, he shows how, upon closer statistical investigation, errors and blunders often lead to useful information. And how statistical methods have been used to uncover falsified data. Beginning with Edmund Halley’s examination of the Transit of Venus and ending with a discussion of how many tanks Rommel had during the Second World War, the author invites the reader to come along on this easily accessible and fascinating journey of how to identify the nature of errors, minimize the effects of blunders, and figure out who the liars are.

Journey through Genius - William Dunham 1991-01-16

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

Great Moments in Mathematics - Howard Eves 1998-12-31

A Concise History of Mathematics - Dirk Jan Struik 1967

This compact, well-written history covers major mathematical ideas and techniques from the ancient Near East to 20th-century computer theory, surveying the works of Archimedes, Pascal, Gauss, Hilbert, and many others. "The author's ability as a first-class historian as well as an able mathematician has enabled him to produce a work which is unquestionably one of the best." — Nature.

Leonhard Euler - Ronald S. Calinger 2019-12-03

"This is the first full-scale biography of Leonhard Euler (1707-83), one of the greatest mathematicians and theoretical physicists of all time. In this comprehensive and authoritative account, Ronald Calinger connects the story of Euler's eventful life to the astonishing achievements that place him in the company of Archimedes, Newton, and Gauss. Drawing chiefly on Euler's massive published works and correspondence, which fill more than eighty volumes so far, this biography sets Euler's work in its multilayered context--personal, intellectual, institutional, political, cultural, religious, and social. It is a story of nearly incessant accomplishment, from Euler's fundamental contributions to almost every area of pure and applied mathematics--especially calculus, number theory, notation, optics, and celestial, rational, and fluid mechanics--to his advancements in shipbuilding, telescopes, ballistics, cartography, chronology, and music theory. The narrative takes the reader from Euler's childhood and education in Basel through his first period in St. Petersburg, 1727-41, where he gained a European reputation by solving the Basel problem and systematically developing analytical mechanics. Invited to Berlin by Frederick II, Euler published his famous Introductio in analysin infinitorum, devised continuum mechanics, and proposed a pulse theory of light. Returning to St. Petersburg in 1766, he created the analytical calculus of variations, developed the most precise lunar theory of the time that supported Newton's dynamics, and published the best-selling Letters to a German Princess--all despite eye problems that ended in near-total blindness. In telling the remarkable story of Euler and how his achievements brought pan-European distinction to the Petersburg and Berlin academies of sciences, the book also demonstrates with new depth and detail the central role of mathematics in the Enlightenment."--

Publisher's description.

Abel's Proof - Peter Pesic 2016-06-17

The intellectual and human story of a mathematical proof that transformed our ideas about mathematics. In 1824 a young Norwegian named Niels Henrik Abel proved conclusively that algebraic equations of the fifth order are not solvable in radicals. In this book Peter Pesic shows what an important event this was in the history of thought. He also presents it as a remarkable human story. Abel was twenty-one when he self-published his proof, and he died five years later, poor and depressed, just before the proof started to receive wide acclaim. Abel's attempts to reach out to the mathematical elite of the day had been spurned, and he was unable to find a position that would allow him to work in peace and marry his fiancé. But Pesic's story begins long before Abel and continues to the present day, for Abel's proof changed how we think about mathematics and its relation to the "real" world. Starting with the Greeks, who invented the idea of mathematical proof, Pesic shows how mathematics found its sources in the real world (the shapes of things, the accounting needs of merchants) and then reached beyond those sources toward something more universal. The Pythagoreans' attempts to deal with irrational numbers foreshadowed the slow emergence of abstract mathematics. Pesic focuses on the contested development of algebra—which even Newton resisted—and the gradual acceptance of the usefulness and perhaps even beauty of abstractions that seem to invoke realities with dimensions outside human experience. Pesic tells this story as a history of ideas, with mathematical details incorporated in boxes. The book also includes a new annotated translation of Abel's original proof.

Things to Make and Do in the Fourth Dimension - Matt Parker 2014-12-02

A book from the stand-up mathematician that makes math fun again! Math is boring, says the mathematician and comedian Matt Parker. Part of the problem may be the way the subject is taught, but it's also true that we all, to a greater or lesser extent, find math difficult and counterintuitive. This counterintuitiveness is actually part of the point, argues Parker: the extraordinary thing about math is that it allows us to access logic and ideas beyond what our brains can instinctively do—through its logical tools we are able to reach beyond our innate abilities and grasp more and more abstract concepts. In the absorbing and exhilarating Things to Make and Do in the Fourth Dimension, Parker sets out to convince his readers to revisit the very math that put them off the subject as fourteen-year-olds. Starting with the foundations of math familiar from school (numbers, geometry, and algebra), he reveals how it is possible to climb all the way up to the topology and to four-dimensional shapes, and from there to infinity—and slightly beyond. Both playful and sophisticated, Things to Make and Do in the Fourth Dimension is filled with captivating games and puzzles, a buffet of optional hands-on activities that entices us to take pleasure in math that is normally only available to those studying at a university level. Things to Make and Do in the Fourth Dimension invites us to re-learn much of what we missed in school and, this time, to be utterly enthralled by it.

Incompleteness - Rebecca Goldstein 2005

A portrait of the eminent twentieth-century mathematician discusses his groundbreaking theorem of incompleteness, contributions within the famous Vienna circle, relationships with such contemporaries as Albert Einstein, and untimely death as a result of mental instability and self-starvation. 30,000 first printing.

The First Book of Euclid's Elements - Euclid 1892

How to Read Historical Mathematics - Benjamin Wardhaugh 2010-03-01

Techniques for deciphering texts by early mathematicians Writings by early mathematicians feature language and notations that are quite different from what we're familiar with today. Sourcebooks on the history of mathematics provide some guidance, but what has been lacking is a guide tailored to the needs of readers approaching these writings for the first time. How to Read Historical Mathematics fills this gap by introducing readers to the analytical questions historians ask when deciphering historical texts. Sampling actual writings from the history of mathematics, Benjamin Wardhaugh reveals the questions that will unlock

the meaning and significance of a given text—Who wrote it, why, and for whom? What was its author's intended meaning? How did it reach its present form? Is it original or a translation? Why is it important today? Wardhaugh teaches readers to think about what the original text might have looked like, to consider where and when it was written, and to formulate questions of their own. Readers pick up new skills with each chapter, and gain the confidence and analytical sophistication needed to tackle virtually any text in the history of mathematics. Introduces readers to the methods of textual analysis used by historians Uses actual source material as examples Features boxed summaries, discussion questions, and suggestions for further reading Supplements all major sourcebooks in mathematics history Designed for easy reference Ideal for students and teachers

Living Proof - Allison K. Henrich 2019

Wow! This is a powerful book that addresses a long-standing elephant in the mathematics room. Many people learning math ask ``Why is math so hard for me while everyone else understands it?'' and ``Am I good enough to succeed in math?'' In answering these questions the book shares personal stories from many now-accomplished mathematicians affirming that ``You are not alone; math is hard for everyone'' and ``Yes; you are good enough.'' Along the way the book addresses other issues such as biases and prejudices that mathematicians encounter, and it provides inspiration and emotional support for mathematicians ranging from the experienced professor to the struggling mathematics student. --Michael Dorff, MAA President This book is a remarkable collection of personal reflections on what it means to be, and to become, a mathematician. Each story reveals a unique and refreshing understanding of the barriers erected by our cultural focus on ``math is hard.'' Indeed, mathematics is hard, and so are many other things--as Stephen Kennedy points out in his cogent introduction. This collection of essays offers inspiration to students of mathematics and to mathematicians at every career stage. --Jill Pipher, AMS President This book is published in cooperation with the Mathematical Association of America.

Math on Trial - Leila Schneps 2013-03-12

In the wrong hands, math can be deadly. Even the simplest numbers can become powerful forces when manipulated by politicians or the media, but in the case of the law, your liberty -- and your life -- can depend on the right calculation. In Math on Trial, mathematicians Leila Schneps and Coralie Colmez describe ten trials spanning from the nineteenth century to today, in which mathematical arguments were used -- and disastrously misused -- as evidence. They tell the stories of Sally Clark, who was accused of murdering her children by a doctor with a faulty sense of calculation; of nineteenth-century tycoon Hetty Green, whose dispute over her aunt's will became a signal case in the forensic use of mathematics; and of the case of Amanda Knox, in which a judge's misunderstanding of probability led him to discount critical evidence -- which might have kept her in jail. Offering a fresh angle on cases from the nineteenth-century Dreyfus affair to the murder trial of Dutch nurse Lucia de Berk, Schneps and Colmez show how the improper application of mathematical concepts can mean the difference between walking free and life in prison. A colorful narrative of mathematical abuse, Math on Trial blends courtroom drama, history, and math to show that legal expertise isn't always enough to prove a person innocent.

Mathematics Through the Eyes of Faith - Russell Howell

Book description to come.

A History of Mathematics - Carl B. Boyer 2011-01-11

The updated new edition of the classic and comprehensive guide to the history of mathematics For more than forty years, A History of Mathematics has been the reference of choice for those looking to learn about the fascinating history of humankind’s relationship with numbers, shapes, and patterns. This revised edition features up-to-date coverage of topics such as Fermat’s Last Theorem and the Poincaré Conjecture, in addition to recent advances in areas such as finite group theory and computer-aided proofs. Distills thousands of years of mathematics into a single, approachable volume Covers mathematical discoveries, concepts, and thinkers, from Ancient Egypt to the present Includes up-to-date references and an extensive chronological table of mathematical and

general historical developments. Whether you're interested in the age of Plato and Aristotle or Poincaré and Hilbert, whether you want to know more about the Pythagorean theorem or the golden mean, A History of Mathematics is an essential reference that will help you explore the incredible history of mathematics and the men and women who created it.

The Mathematician's Brain - David Ruelle 2018-06-26

The Mathematician's Brain poses a provocative question about the world's most brilliant yet eccentric mathematical minds: were they brilliant because of their eccentricities or in spite of them? In this thought-provoking and entertaining book, David Ruelle, the well-known mathematical physicist who helped create chaos theory, gives us a rare insider's account of the celebrated mathematicians he has known-their quirks, oddities, personal tragedies, bad behavior, descents into madness, tragic ends, and the sublime, inexpressible beauty of their most breathtaking mathematical discoveries. Consider the case of British mathematician Alan Turing. Credited with cracking the German Enigma code during World War II and conceiving of the modern computer, he was convicted of "gross indecency" for a homosexual affair and died in 1954 after eating a cyanide-laced apple--his death was ruled a suicide, though rumors of assassination still linger. Ruelle holds nothing back in his revealing and deeply personal reflections on Turing and other fellow mathematicians, including Alexander Grothendieck, René Thom, Bernhard Riemann, and Felix Klein. But this book is more than a mathematical tell-all. Each chapter examines an important mathematical idea and the visionary minds behind it. Ruelle meaningfully explores the philosophical issues raised by each, offering insights into the truly unique and creative ways mathematicians think and showing how the mathematical setting is most favorable for asking philosophical questions about meaning, beauty, and the nature of reality. The Mathematician's Brain takes you inside the world--and heads--of mathematicians. It's a journey you won't soon forget.

Book of Proof - Richard H. Hammack 2016-01-01

This book is an introduction to the language and standard proof methods of mathematics. It is a bridge from the computational courses (such as calculus or differential equations) that students typically encounter in their first year of college to a more abstract outlook. It lays a foundation for more theoretical courses such as topology, analysis and abstract algebra. Although it may be more meaningful to the student who has had some calculus, there is really no prerequisite other than a measure of mathematical maturity.

Prime Obsession - John Derbyshire 2003-04-15

In August 1859 Bernhard Riemann, a little-known 32-year old mathematician, presented a paper to the Berlin Academy titled: "On the Number of Prime Numbers Less Than a Given Quantity." In the middle of that paper, Riemann made an incidental remark â€" a guess, a hypothesis. What he tossed out to the assembled mathematicians that day has proven to be almost cruelly compelling to countless scholars in the ensuing years. Today, after 150 years of careful research and exhaustive study, the question remains. Is the hypothesis true or false? Riemann's basic inquiry, the primary topic of his paper, concerned a straightforward but nevertheless important matter of arithmetic â€" defining a precise formula to track and identify the occurrence of prime numbers. But it is that incidental remark â€" the Riemann Hypothesis â€" that is the truly astonishing legacy of his 1859 paper. Because Riemann was able to see beyond the pattern of the primes to discern traces of something mysterious and mathematically elegant shrouded in the shadows â€" subtle variations in the distribution of those prime numbers. Brilliant for its clarity, astounding for its potential consequences, the Hypothesis took on enormous importance in mathematics. Indeed, the successful solution to this puzzle would herald a revolution in prime number theory. Proving or disproving it became the greatest challenge of the age. It has become clear that the Riemann Hypothesis, whose resolution seems to hang tantalizingly just beyond our grasp, holds the key to a variety of scientific and mathematical investigations. The making and breaking of modern codes, which depend on the properties of the prime numbers, have roots in the Hypothesis. In a series of extraordinary developments during the 1970s, it emerged that

even the physics of the atomic nucleus is connected in ways not yet fully understood to this strange conundrum. Hunting down the solution to the Riemann Hypothesis has become an obsession for many â€" the veritable "great white whale" of mathematical research. Yet despite determined efforts by generations of mathematicians, the Riemann Hypothesis defies resolution. Alternating passages of extraordinarily lucid mathematical exposition with chapters of elegantly composed biography and history, Prime Obsession is a fascinating and fluent account of an epic mathematical mystery that continues to challenge and excite the world. Posited a century and a half ago, the Riemann Hypothesis is an intellectual feast for the cognoscenti and the curious alike. Not just a story of numbers and calculations, Prime Obsession is the engrossing tale of a relentless hunt for an elusive proof â€" and those who have been consumed by it.

The Man Who Knew Infinity - Robert Kanigel 2016-04-26

A biography of the Indian mathematician Srinivasa Ramanujan. The book gives a detailed account of his upbringing in India, his mathematical achievements, and his mathematical collaboration with English mathematician G. H. Hardy. The book also reviews the life of Hardy and the academic culture of Cambridge University during the early twentieth century.

The Historical Roots of Elementary Mathematics - Lucas N. H. Bunt 2012-12-11

Exciting, hands-on approach to understanding fundamental underpinnings of modern arithmetic, algebra, geometry and number systems examines their origins in early Egyptian, Babylonian, and Greek sources.

The Calculus Gallery - William Dunham 2018-11-13

More than three centuries after its creation, calculus remains a dazzling intellectual achievement and the gateway to higher mathematics. This book charts its growth and development by sampling from the work of some of its foremost practitioners, beginning with Isaac Newton and Gottfried Wilhelm Leibniz in the late seventeenth century and continuing to Henri Lebesgue at the dawn of the twentieth. Now with a new preface by the author, this book documents the evolution of calculus from a powerful but logically chaotic subject into one whose foundations are thorough, rigorous, and unflinching—a story of genius triumphing over some of the toughest, subtlest problems imaginable. In touring The Calculus Gallery, we can see how it all came to be.

Great Moments in Mathematics Before 1650 - Howard Eves 1983-12-31

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.

A History of Mathematics - Luke Hodgkin 2013-02-21

A History of Mathematics: From Mesopotamia to Modernity covers the evolution of mathematics through time and across the major Eastern and Western civilizations. It begins in Babylon, then describes the trials and tribulations of the Greek mathematicians. The important, and often neglected, influence of both Chinese and Islamic mathematics is covered in detail, placing the description of early Western mathematics in a global context. The book concludes with modern mathematics, covering recent developments such as the advent of the computer, chaos theory, topology, mathematical physics, and the solution of Fermat's Last Theorem. Containing more than 100 illustrations and figures, this text, aimed at advanced undergraduates and postgraduates, addresses the methods and challenges associated with studying the history of mathematics. The reader is introduced to the leading figures in the history of mathematics (including Archimedes, Ptolemy, Qin Jiushao, al-Kashi, al-Khwarizmi, Galileo, Newton, Leibniz, Helmholtz, Hilbert, Alan Turing, and Andrew Wiles) and their fields. An extensive bibliography with cross-references to key texts will provide invaluable resource to

students and exercises (with solutions) will stretch the more advanced reader.

The Mathematical Universe - William Dunham 1997-02-18

"Dunham writes for nonspecialists, and they will enjoy his piquantanecdotes and amusing asides -- Booklist "Artfully, Dunham conducts a tour of the mathematical universe. . .he believes these ideas to be accessible to the audience he wantsto reach, and he writes so that they are." -- Nature "If you want to encourage anyone's interest in math, get them TheMathematical Universe." * New Scientist

Euler - William Dunham 1999-03-04

This book examines the huge scope of mathematical areas explored and developed by Leonhard Euler.

A Mathematician's Lament - Paul Lockhart 2009-04-01

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Infinitesimal: How a Dangerous Mathematical Theory Shaped the Modern World - Amir Alexander 2014-04-08

This fascinating volume, taking readers from the blood religious strife of the 16th century to the battlefields of the English civil war, recounts the epic battle over a simple, yet "forbidden," mathematical concept that would eventually become the foundation of calculus. 30,000 first printing.