# [eBooks] In Code A Mathematical Journey Sarah Flannery

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In Code-Sarah Flannery 2002-01-01 Originally published in England and cowritten with her father, "In Code" is "a wonderfully moving story about the thrill of the mathematical chase" ("Nature") and "a paean to intellectual adventure" ("Times Educational Supplement"). A memoir in mathematics, it is all about how a girl next door became an award-winning mathematician. photo insert.

In Code-Sarah Flannery 2001 Sarah Flannery is a cryptographer and mathematician already with an international reputation. She is also a sport-loving Co. Cork teenager who takes her Leaving Certificate next year. In this remarkable book, written with her father, her first maths teacher, she writes about her life, mathematics and making codes - and this extraordinary year. That is just one of the scores of media comments from all over the world which followed Sarah's winning this January, at the age of 16, the Irish Young Scientist of the Year award with a highly innovative, speedy and secure system of encoding data on the Internet. Since then she has travelled the world and lectured, and had approaches from many computer companies and universities. Her system still needs full peer evaluation but what is not in doubt is the originality of her mathematical mind. Her book offers many different things: it is a fresh and modest self-portrait by a girl who is the reverse of a comic-strip swot; it is an inspiring account of a mathematical education; with many puzzles and examples it offers a mass of insights into cryptography and numeracy.

A Mathematical Journey-Stanley Gudder 1994

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.

The Ellipse-Arthur Mazer 2011-09-26 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.

1089 and All That-D. J. Acheson 2002 This excellent book, written by the established author David Acheson, makes mathematics accessible to everyone. Providing an entertaining and witty overview of the subject, the text includes several fascinating puzzles, and is accompanied by numerous illustrations and sketches by world famouscartoonists. This unusual book is one of the most readable explanations of mathematics available.

Journey through Mathematics-Enrique A. González-Velasco 2011-08-08 This book offers an accessible and in-depth look at some of the most important episodes of two thousand years of mathematical history. Beginning with trigonometry and moving on through logarithms, complex numbers, infinite series, and calculus, this book profiles some of the lesser known but crucial contributors to modern day mathematics. It is unique in its use of primary sources as well as its accessibility; a knowledge of first-year calculus is the only prerequisite. But undergraduate and graduate students alike will appreciate this glimpse into the fascinating process of mathematical creation. The history of math is an intercontinental journey, and this book showcases brilliant mathematicians from Greece, Egypt, and India, as well as Europe and the Islamic world. Several of the primary sources have never before been translated into English. Their interpretation is thorough and readable, and offers an excellent background for teachers of high school mathematics as well as anyone interested in the history of math.

A Mathematical Bridge-Stephen Hewson 2009-01-20 Although higher mathematics is beautiful, natural and interconnected, to the uninitiated it can feel like an arbitrary mass of disconnected technical definitions, symbols, theorems and methods. An intellectual gulf needs to be crossed before a true, deep appreciation of mathematics can develop. This book bridges this mathematical gap. It focuses on the process of discovery as much as the content, leading the reader to a clear, intuitive understanding of how and why mathematics exists in the way it does. The narrative does not evolve along traditional subject lines: each topic develops from its simplest, intuitive starting point; complexity develops naturally via questions and extensions. Throughout, the book includes levels of explanation, discussion and passion rarely seen in traditional textbooks. The choice of material is similarly rich, ranging from number theory and the nature of mathematical thought to quantum mechanics and the history of mathematics. It rounds off with a selection of thought-provoking and stimulating exercises for the reader.

Journey Through Genius-William Dunham 1991 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

Journey into Mathematics-Joseph J. Rotman 2013-01-18 This treatment covers the mechanics of writing proofs, the area and circumference of circles, and complex numbers and their application to real numbers. 1998 edition.

A First Journey through Logic-Martin Hils 2019-09-11 The aim of this book is to present mathematical logic to students who are interested in what this field is but have no intention of specializing in it. The point of view is to treat logic on an equal footing to any other topic in the mathematical curriculum. The book starts with a presentation of naive set theory, the theory of sets that mathematicians use on a daily basis. Each subsequent chapter presents one of the main areas of mathematical logic: first order logic and formal proofs, model theory, recursion theory, Gödel's incompleteness theorem, and, finally, the axiomatic set theory. Each chapter includes several interesting highlights—outside of logic when possible—either in the main text, or as exercises or appendices. Exercises are an essential component of the book, and a good number of them are designed to provide an opening to additional topics of interest.

Mathemagics: A Magical Journey Through Advanced Mathematics - Connecting More Than 60 Magic Tricks To High-level Math-Ricardo V Teixeira 2020-05-29 Teixeira and Park present over 60 different magic tricks while introducing students to high-level math areas. Readers will learn really interesting ideas that will better prepare them for future courses and help them finding areas they might want to study deeper. And as a 'side effect' students will learn amazing magic tricks, century-old secrets, and details from famous magicians and mathematicians.The material was written to quickly present key concepts in several mathematical areas in direct way. Little or no proficiency in math is assumed. In fact, students do not require any Calculus knowledge. And since chapters are almost independent from each other, this book also work as introduction to several other courses.Topics covered include mathematical proofs, probability, abstract algebra, linear algebra, mathematical computing, number theory, coding theory, geometry, topology, real analysis, numerical analysis and history of math.

Embracing Beauty-John Heard 2019-03-31 Traces the development of pure mathematics during the long nineteenth century in Britain, with extensive references and primary sources.

The Secrets of Triangles-Alfred S. Posamentier 2012-08-28 Requiring no more than a knowledge of high school mathematics and written in clear and accessible language, this book will give all readers a new insight into some of the most enjoyable and fascinating aspects of geometry. Everyone knows what a triangle is, yet very few people appreciate that the common three-sided figure holds many intriguing "secrets." For example, if a circle is inscribed in any random triangle and then three lines are drawn from the three points of tangency to the opposite vertices of the triangle, these lines will always meet at a common point-no matter what the shape of the triangle. This and many more interesting geometrical properties are revealed in this entertaining and illuminating book about geometry. Flying in the face of the common impression that mathematics is usually dry and intimidating, this book proves that this sometimes-daunting, abstract discipline can be both fun and intellectually stimulating. The authors, two veteran math educators, explore the multitude of surprising relationships connected with triangles and show some clever approaches to constructing triangles using a straightedge and a compass. Readers will learn how they can improve their problem-solving skills by performing these triangle constructions. The lines, points, and circles related to triangles harbor countless surprising relationships that are presented here in a very engaging fashion.

Markov's Theorem and 100 Years of the Uniqueness Conjecture-Martin Aigner 2013-07-18 This book takes the reader on a mathematical journey, from a number-theoretic point of view, to the realm of Markov's theorem and the uniqueness conjecture, gradually unfolding many beautiful connections until everything falls into place in the proof of Markov's theorem. What makes the Markov theme so attractive is that it appears in an astounding variety of different fields, from number theory to combinatorics, from classical groups and geometry to the world of graphs and words. On the way, there are also introductory forays into some fascinating topics that do not belong to the standard curriculum, such as Farey fractions, modular and free groups, hyperbolic planes, and algebraic words. The book closes with a discussion of the current state of knowledge about the uniqueness conjecture, which remains an open challenge to this day. All the material should be accessible to upper-level undergraduates with some background in number theory, and anything beyond this level is fully explained in the text. This is not a monograph in the usual sense concentrating on a specific topic. Instead, it narrates in five parts – Numbers, Trees, Groups, Words, Finale – the story of a discovery in one field and its many manifestations in others, as a tribute to a great mathematical achievement and as an intellectual pleasure, contemplating the marvellous unity of all mathematics.

Journey into Discrete Mathematics-Owen D. Byer 2018-11-13 Journey into Discrete Mathematics is designed for use in a first course in mathematical abstraction for early-career undergraduate mathematics majors. The important ideas of discrete mathematics are included—logic, sets, proof writing, relations, counting, number theory, and graph theory—in a manner that promotes development of a mathematical mindset and prepares students for further study. While the treatment is designed to prepare the student reader for the mathematics major, the book remains attractive and appealing to students of computer science and other problem-solving disciplines. The exposition is exquisite and engaging and features detailed descriptions of the thought processes that one might follow to attack the problems of mathematics. The problems are appealing and vary widely in depth and difficulty. Careful design of the book helps the student reader learn to think like a mathematician through the exposition and the problems provided. Several of the core topics, including counting, number theory, and graph theory, are visited twice: once in an introductory manner and then again in a later chapter with more advanced concepts and with a deeper perspective. Owen D. Byer and Deirdre L. Smeltzer are both Professors of Mathematics at Eastern Mennonite University. Kenneth L. Wantz is Professor of Mathematics at Regent University. Collectively the authors have specialized expertise and research publications ranging widely over discrete mathematics and have over fifty semesters of combined experience in teaching this subject.

A Brief Journey in Discrete Mathematics-Randolph Nelson 2020-02-11 The goal of this book is to showcase the beauty of mathematics as revealed in nine topics of discrete mathematics. In each chapter, properties are explored through a series of straightforward questions that terminate with results that lie at the doorstep of a field of study. Each step along the way is elementary and requires only algebraic manipulation. This frames the wonder of mathematics and highlights the complex world that lies behind a series of simple, mathematical, deductions. Topics addressed include combinatorics, unifying properties of symmetric functions, the Golden ratio as it leads to k-bonacci numbers, non-intuitive and surprising results found in a simple coin tossing game, the playful, trick question aspect of modular systems, exploration of basic properties of prime numbers and derivations of bewildering results that arise from approximating irrational numbers as continued fraction expansions. The Appendix contains the basic tools of mathematics that are used in the text along with a numerous list of identities that are derived in the body of the book. The mathematics in the book is derived from first principles. On only one occasion does it rely on a result not derived within the text. Since the book does not require calculus or advanced techniques, it should be accessible to advanced high school students and undergraduates in math or computer science. Senior mathematicians might be unfamiliar with some of the topics addressed in its pages or find interest in the book's unified approach to discrete math.

Symmetry-Marcus du Sautoy 2009-10-13 Symmetry is all around us. Of fundamental significance to the way we interpret the world, this unique, pervasive phenomenon indicates a dynamic relationship between objects. Combining a rich historical narrative with his own personal journey as a mathematician, Marcus du Sautoy takes a unique look into the mathematical mind as he explores deep conjectures about symmetry and brings us face-to-face with the oddball mathematicians, both past and present, who have battled to understand symmetry's elusive qualities.

Portal through Mathematics: Journey to Advanced Thinking-O. A. Ivanov 2019-10-09 Portal through Mathematics is a collection of puzzles and problems mostly on topics relating to secondary mathematics. The problems and topics are fresh and interesting and frequently surprising. One example: the puzzle that asks how much length must be added to a belt around the Earth's equator to raise it one foot has probably achieved old chestnut status. Ivanov, after explaining the surprising answer to this question, goes a step further and asks, if you grabbed that too long belt at some point and raised it as high as possible, how high would that be? The answer to that is more surprising than the classic puzzle's answer. The book is organized into 29 themes, each a topic from algebra, geometry or calculus and each launched from an opening puzzle or problem. There are excursions into number theory, solid geometry, physics and combinatorics. Always there is an emphasis on surprise and delight. And every theme begins at a level approachable with minimal background requirements. With well over 250 puzzles and problems, there is something here sure to appeal to everyone. Portal through Mathematics will be useful for prospective secondary teachers of mathematics and may be used (as a supplementary resource) in university courses in algebra, geometry, calculus, and discrete mathematics. It can also be used for professional development for teachers looking for inspiration. However, the intended audience is much broader. Every fan of mathematics will find enjoyment in it.

The Power of q-Michael D. Hirschhorn 2017-08-08 This unique book explores the world of q, known technically as basic hypergeometric series, and represents the author's personal and life-long study—inspired by Ramanujan—of aspects of this broad topic. While the level of mathematical sophistication is graduated, the book is designed to appeal to advanced undergraduates as well as researchers in the field. The principal aims are to demonstrate the power of the methods and the beauty of the results. The book contains novel proofs of many results in the theory of partitions and the theory of representations, as well as associated identities. Though not specifically designed as a textbook, parts of it may be presented in course work; it has many suitable exercises. After an introductory chapter, the power of q-series is demonstrated with proofs of Lagrange's four-squares theorem and Gauss's two-squares theorem. Attention then turns to partitions and Ramanujan's partition congruences. Several proofs of these are given throughout the book. Many chapters are devoted to related and other associated topics. One highlight is a simple proof of an identity of Jacobi with application to string theory. On the way, we come across the Rogers–Ramanujan identities and the Rogers–Ramanujan continued fraction, the famous "forty identities" of Ramanujan, and the representation results of Jacobi, Dirichlet and Lorenz, not to mention many other interesting and beautiful results. We also meet a challenge of D.H. Lehmer to give a formula for the number of partitions of a number into four squares, prove a "mysterious" partition theorem of H. Farkas and prove a conjecture of R.Wm. Gosper "which even Erdös couldn't do." The book concludes with a look at Ramanujan's remarkable tau function.

Essentials of Mathematical Thinking-Steven G. Krantz 2017-10-06 Essentials of Mathematical Thinking addresses the growing need to better comprehend mathematics today. Increasingly, our world is driven by mathematics in all aspects of life. The book is an excellent introduction to the world of mathematics for students not majoring in mathematical studies. The author has written this book in an enticing, rich manner that will engage students and introduce new paradigms of thought. Careful readers will develop critical thinking skills which will help them compete in today's world. The book explains: What goes behind a Google search algorithm How to calculate the odds in a lottery The value of Big Data How the nefarious Ponzi scheme operates Instructors will treasure the book for its ability to make the field of mathematics more accessible and alluring with relevant topics and helpful graphics. The author also encourages readers to see the beauty of mathematics and how it relates to their lives in meaningful ways.

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

From Mathematics to Generic Programming-Alexander A. Stepanov 2014-11-13 In this substantive yet accessible book, pioneering software designer Alexander Stepanov and his colleague Daniel Rose illuminate the principles of generic programming and the mathematical concept of abstraction on which it is based, helping you write code that is both simpler and more powerful. If you're a reasonably proficient programmer who can think logically, you have all the background you'll need. Stepanov and Rose introduce the relevant abstract algebra and number theory with exceptional clarity. They carefully explain the problems mathematicians first needed to solve, and then show how these mathematical solutions translate to generic programming and the creation of more effective and elegant code. To demonstrate the crucial role these mathematical principles play in many modern applications, the authors show how to use these results and generalized algorithms to implement a real-world public-key cryptosystem. As you read this book, you'll master the thought processes necessary for effective programming and learn how to generalize narrowly

conceived algorithms to widen their usefulness without losing efficiency. You'll also gain deep insight into the value of mathematics to programming—insight that will prove invaluable no matter what programming languages and paradigms you use. You will learn about How to generalize a four thousand-year-old algorithm, demonstrating indispensable lessons about clarity and efficiency Ancient paradoxes, beautiful theorems, and the productive tension between continuous and discrete A simple algorithm for finding greatest common divisor (GCD) and modern abstractions that build on it Powerful mathematical approaches to abstraction How abstract algebra provides the idea at the heart of generic programming Axioms, proofs, theories, and models: using mathematical techniques to organize knowledge about your algorithms and data structures Surprising subtleties of simple programming tasks and what you can learn from them How practical implementations can exploit theoretical knowledge

The Mathematics of Secrets-Joshua Holden 2018-10-02 The Mathematics of Secrets takes readers on a fascinating tour of the mathematics behind cryptography—the science of sending secret messages. Using a wide range of historical anecdotes and real-world examples, Joshua Holden shows how mathematical principles underpin the ways that different codes and ciphers work. He focuses on both code making and code breaking and discusses most of the ancient and modern ciphers that are currently known. He begins by looking at substitution ciphers, and then discusses how to introduce flexibility and additional notation. Holden goes on to explore polyalphabetic substitution ciphers, transposition ciphers, connections between ciphers and computer encryption, stream ciphers, public-key ciphers, and ciphers involving exponentiation. He concludes by looking at the future of ciphers and where cryptography might be headed. The Mathematics of Secrets reveals the mathematics working stealthily in the science of coded messages. A blog describing new developments and historical discoveries in cryptography related to the material in this book is accessible at http://press.princeton.edu/titles/10826.html.

The Number Mysteries-Marcus du Sautoy 2011-05-24 Every time we download music, take a flight across the Atlantic or talk on our cell phones, we are relying on great mathematical inventions. In The Number Mysteries, one of our generation's foremost mathematicians Marcus du Sautoy offers a playful and accessible examination of numbers and how, despite efforts of the greatest minds, the most fundamental puzzles of nature remain unsolved. Du Sautoy tells about the quest to predict the future—from the flight of asteroids to an impending storm, from bending a ball like Beckham to forecasting population growth. He brings to life the beauty behind five mathematical puzzles that have contributed to our understanding of the world around us and have helped develop the technology to cope with it. With loads of games to play and puzzles to solve, this is a math book for everyone.

A Journey from Robot to Digital Human-Edward Y L Gu 2013-07-24 This book provides readers with a solid set of diversified and essential tools for the theoretical modeling and control of complex robotic systems, as well as for digital human modeling and realistic motion generation. Following a comprehensive introduction to the fundamentals of robotic kinematics, dynamics and control systems design, the author extends robotic modeling procedures and motion algorithms to a much higher-dimensional, larger scale and more sophisticated research area, namely digital human modeling. Most of the methods are illustrated by MATLABTM codes and sample graphical visualizations, offering a unique closed loop between conceptual understanding and visualization. Readers are guided through practicing and creating 3D graphics for robot arms as well as digital human models in MATLABTM, and through driving them for real-time animation. This work is intended to serve as a robotics textbook with an extension to digital human modeling for senior undergraduate and graduate engineering students. At the same time, it represents a comprehensive reference guide for all researchers, scientists and professionals eager to learn the fundamentals of robotic systems as well as the basic methods of digital human modeling and motion generation.

The Babylonian Theorem-Peter Strom Rudman 2010 In this sequel to his award-winning How Mathematics Happened, physicist Peter S. Rudman explores the history of mathematics among the Babylonians and Egyptians, showing how their scribes in the era from 2000 to 1600 BCE used visualizations of how plane geometric figures could be partitioned into squares, rectangles, and right triangles to invent geometric algebra, even solving problems that we now do by quadratic algebra. Using illustrations adapted from both Babylonian cuneiform tablets and Egyptian hieroglyphic texts, Rudman traces the evolution of mathematics from the metric geometric algebra of Babylon and Egypt-which used numeric quantities on diagrams as a means to work out problems-to the nonmetric geometric algebra of Euclid (ca. 300 BCE).Thus, Rudman traces the evolution of calculations of square roots from Egypt and Babylon to India, and then to Pythagoras, Archimedes, and Ptolemy. Surprisingly, the best calculation was by a Babylonian scribe who calculated the square root of two to seven decimal-digit precision. Rudman provocatively asks, and then interestingly conjectures, why such a precise calculation was made in a mud-brick culture.From his analysis of Babylonian geometric algebra, Rudman formulates a Babylonian Theorem, which he shows was used to derive the Pythagorean Theorem, about a millennium before its purported discovery by Pythagoras.He also concludes that what enabled the Greek mathematicians to surpass their predecessors was the insertion of alphabetic notation onto geometric figures. Such symbolic notation was natural for users of an alphabetic language, but was impossible for the Babylonians and Egyptians, whose writing systems (cuneiform and hieroglyphics, respectively) were not alphabetic.Rudman intersperses his discussions of early math conundrums and solutions with Fun Questions for those who enjoy recreational math and wish to test their understanding. The Babylonian Theorem is a masterful, fascinating, and entertaining book, which will interest both math enthusiasts and students of history.Peter S. Rudman (Tel Aviv, Israel), a retired professor of physics at the Technion-Israel Institute of Technology, is the author of How Mathematics Happened: The First 50,000 Years, which was selected in 2008 as an Outstanding Academic Text by the American Library Association.

Solve This-James S. Tanton 2001-08-23 This is a collection of intriguing mathematical problems and activities arising from our everyday experience.

The Code Book: The Secrets Behind Codebreaking-Simon Singh 2002-05-14 "As gripping as a good thriller." --The Washington Post Unpack the science of secrecy and discover the methods behind cryptography--the encoding and decoding of information--in this clear and easy-to-understand young adult adaptation of the national bestseller that's perfect for this age of WikiLeaks, the Sony hack, and other events that reveal the extent to which our technology is never quite as secure as we want to believe. Coders and codebreakers alike will be fascinated by history's most mesmerizing stories of intrigue and cunning--from Julius Caesar and his Caeser cipher to the Allies' use of the Enigma machine to decode German messages during World War II. Accessible, compelling, and timely, The Code Book is sure to make readers see the past--and the future--in a whole new way. "Singh's power of explaining complex ideas is as dazzling as ever." --The Guardian

More Math Games and Activities from Around the World-Claudia Zaslavsky 2003-10 Presents games and other activities from different countries and cultures that teach a variety of basic mathematical concepts.

Mathematics for Machine Learning-Marc Peter Deisenroth 2020-04-23 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.

The Creativity Code-Marcus Du Sautoy 2020-03-03 Most books on AI focus on the future of work. But now that algorithms can learn and adapt, does the future of creativity also belong to well-programmed machines? To answer this question, Marcus du Sautoy takes us to the forefront of creative new technologies and offers a more positive and unexpected vision of our future cohabitation with machines.

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.

The Square Root of 2-David Flannery 2006-04-26 An elegantly dramatized and illustrated dialog on the square root of two and the whole concept of irrational numbers.

Mathematics: Journey from Basic Mathematics through Intermediate Algebra-Richard N. Aufmann 2020-04-28 Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

The Advent of the Algorithm-David Berlinski 2001 Describes the invention of the algorithm, first theorized by Leibniz, and the dramatic implications of this mathematical discovery on the development of computer technology and the working of DNA.

Here's Looking at Euclid-Alex Bellos 2010-06-15 Too often math gets a bad rap, characterized as dry and difficult. But, Alex Bellos says, "math can be inspiring and brilliantly creative. Mathematical thought is one of the great achievements of the human race, and arguably the foundation of all human progress. The world of mathematics is a remarkable place." Bellos has traveled all around the globe and has plunged into history to uncover fascinating stories of mathematical achievement, from the breakthroughs of Euclid, the greatest mathematician of all time, to the creations of the Zen master of origami, one of the hottest areas of mathematical work today. Taking us into the wilds of the Amazon, he tells the story of a tribe there who can count only to five and reports on the latest findings about the math instinct—including the revelation that ants can actually count how many steps they've taken. Journeying to the Bay of Bengal, he interviews a Hindu sage about the brilliant mathematical insights of the Buddha, while in Japan he visits the godfather of Sudoku and introduces the brainteasing delights of mathematical games. Exploring the mysteries of randomness, he explains why it is impossible for our iPods to truly randomly select songs. In probing the many intrigues of that most beloved of numbers, pi, he visits with two brothers so obsessed with the elusive number that they built a supercomputer in their Manhattan apartment to study it. Throughout, the journey is enhanced with a wealth of intriguing illustrations, such as of the clever puzzles known as tangrams and the crochet creation of an American math professor who suddenly realized one day that she could knit a representation of higher dimensional space that no one had been able to visualize. Whether writing about how algebra solved Swedish traffic problems, visiting the Mental Calculation World Cup to disclose the secrets of lightning calculation, or exploring the links between pineapples and beautiful teeth, Bellos is a wonderfully engaging guide who never fails to delight even as he edifies. Here's Looking at Euclid is a rare gem that brings the beauty of math to life.

Mathematical Mindsets-Jo Boaler 2015-10-12 Banish math anxiety and give students of all ages a clear roadmap to success Mathematical Mindsets provides practical strategies and activities to help teachers and parents show all children, even those who are convinced that they are bad at math, that they can enjoy and succeed in math. Jo Boaler—Stanford researcher, professor of math education, and expert on math learning—has studied why students don't like math and often fail in math classes. She's followed thousands of students through middle and high schools to study how they learn and to find the most effective ways to unleash the math potential in all students. There is a clear gap between what research has shown to work in teaching math and what happens in schools and at home. This book bridges that gap by turning research findings into practical activities and advice. Boaler translates Carol Dweck's concept of 'mindset' into math teaching and parenting strategies, showing how students can go from self-doubt to strong self-confidence, which is so important to math learning. Boaler reveals the steps that must be taken by schools and parents to improve math education for all. Mathematical Mindsets: Explains how the brain processes mathematics learning Reveals how to turn mistakes and struggles into valuable learning experiences Provides examples of rich mathematical activities to replace rote learning Explains ways to give students a positive math mindset Gives examples of how assessment and grading policies need to change to support real understanding Scores of students hate and fear math, so they end up leaving school without an understanding of basic mathematical concepts. Their evasion and departure hinders math-related pathways and STEM career opportunities. Research has shown very clear methods to change this phenomena, but the information has been confined to research journals—until now. Mathematical Mindsets provides a proven, practical roadmap to mathematics success for any student at any age.

Open Middle Math-Robert Kaplinsky 2019 "The CAFE is an acronym for Comprehension, Accuracy, Fluency, and Expanding Vocabulary. The book provides a framework and system for teaching reading through these core components, and guides readers through the process of responsive teaching"--

Introduction To Mathematical Philosophy-Bertrand Russell 2017-12-22 Originally published in 1919, this work on the philosophy of mathematics is both expensive and hard to find in its first edition. It contains Bertrand Russell's ideas on number definition, cardinal numbers, propositional functions and much more. This is a fascinating work and thoroughly recommended for anyone interested in the philosophy of mathematics. Many of the earliest books, particularly those dating back to the 1900s and before, are now extremely scarce. We are republishing these classic works in affordable, high quality, modern editions, using the original text and artwork.

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