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Journey Through Genius World Scientific

Praise for the Third Edition "Researchers of any kind of extremal combinatorics or theoretical computer science will welcome the new edition of this book." - MAA Reviews Maintaining a standard of excellence that establishes The Probabilistic Method as the leading reference on probabilistic methods in combinatorics, the Fourth Edition continues to feature a clear writing style, illustrative examples, and illuminating exercises. The new edition includes numerous updates to reflect the most recent developments and advances in discrete mathematics and the connections to other areas in mathematics, theoretical computer science, and statistical physics. Emphasizing the methodology and techniques that enable problem-solving, The Probabilistic Method, Fourth Edition begins with a description of tools applied to probabilistic arguments, including basic techniques that use expectation and variance as well as the more advanced applications of martingales and correlation inequalities. The authors explore where probabilistic techniques have been applied successfully and also examine topical coverage such as discrepancy and random graphs, circuit complexity, computational geometry, and derandomization of randomized algorithms. Written by two well-known authorities in the field, the Fourth Edition features: Additional exercises throughout with hints and solutions to select problems in an appendix to help readers obtain a deeper understanding of the best methods and techniques New coverage on topics such as the Local Lemma, Six Standard Deviations result in Discrepancy Theory, Property B, and graph limits Updated sections to reflect major developments on the newest topics, discussions of the hypergraph container method, and many new references and improved results The Probabilistic Method, Fourth Edition is an ideal textbook for upper-undergraduate and graduate-level students majoring in mathematics, computer science, operations research, and statistics. The Fourth Edition is also an excellent reference for researchers and combinatorists who use probabilistic methods, discrete mathematics, and number theory. Noga Alon, PhD, is Baumritter Professor of Mathematics and Computer Science at Tel Aviv University. He is a member of the Israel National Academy of Sciences and Academia Europaea. A coeditor of the journal Random Structures and Algorithms, Dr. Alon is the recipient of the Polya Prize, The Gödel Prize, The Israel Prize, and the EMET Prize. Joel H. Spencer, PhD, is Professor of Mathematics and Computer Science at the Courant Institute of New York University. He is the cofounder and coeditor of the journal Random Structures and Algorithms and is a Sloane Foundation Fellow. Dr. Spencer has written more than 200 published articles and is the coauthor of Ramsey Theory, Second Edition, also published by Wiley.

The Probabilistic Method American Mathematical Soc.

If you've ever bought a personal finance book, watched a TV show about stock picking, listened to a radio show about getting out of debt, or attended a seminar to help you plan for your retirement, you've probably heard some version of these quotes: "What's keeping you from being rich? In most cases, it is simply a lack of belief." —SUZE ORMAN, The Courage to Be Rich "Are you latte-ing away your financial future?" —DAVID BACH, Smart Women Finish Rich "I know you're capable of picking winning stocks and holding on to them." —JIM CRAMER, Mad Money They're common refrains among personal finance gurus. There's just one problem: those and many similar statements are false. For the past few decades, Americans have spent billions of dollars on personal finance products. As salaries have stagnated and companies have cut back on benefits, we've taken matters into our own hands, embracing the can-do attitude that if we're smart enough, we can overcome even daunting financial obstacles. But that's not true. In this meticulously reported and shocking book, journalist and former financial columnist Helaine Olen goes behind the curtain of the personal finance industry to expose the myths, contradictions, and outright lies it has perpetuated. She shows how an industry that started as a response to the Great Depression morphed into a behemoth that thrives by selling us products and services that offer little if any help. Olen calls out some of the biggest names in the business, revealing how even the most respected gurus have engaged in dubious, even deceitful, practices—from accepting payments from banks and corporations in exchange for promoting certain products to blaming the victims of economic catastrophe for their own financial misfortune. Pound Foolish also disproves many myths about spending and saving, including: Small pleasures can bankrupt you: Gurus popularized the idea that cutting out lattes and other small expenditures could make us millionaires. But reducing our caffeine consumption will not offset our biggest expenses: housing, education, health care, and retirement. Disciplined investing will make you rich: Gurus also love to show how steady investing can turn modest savings into a huge nest egg at retirement. But these calculations assume a healthy market and a lifetime without any setbacks—two conditions that have no connection to the real world. Women need extra help managing money: Product pushers often target women, whose alleged financial ignorance supposedly leaves them especially at risk. In reality, women and men are both terrible at handling finances. Financial literacy classes will prevent future economic crises: Experts like to claim mandatory sessions on personal finance in school will cure many of our money ills. Not only is there little evidence this is true, the entire movement is largely funded and promoted by the financial services sector. Weaving together original reporting, interviews with experts, and studies from disciplines ranging from behavioral economics to retirement planning,Pound Foolish is a compassionate and compelling book that will change the way we think and talk about our money.

18 Unconventional Essays on the Nature of Mathematics Il Saggiatore

'Science has never had an advocate quite like David Deutsch ... A computational physicist on a par with his touchstones Alan Turing and Richard Feynman, and a philosopher in the line of his greatest hero, Karl Popper. His arguments are so clear that to read him is to experience the thrill of the highest level of discourse available on this planet and to understand it' Peter Forbes, Independent In our search for truth, how far have we advanced? This uniquely human quest for good explanations has driven amazing improvements in everything from scientific understanding and technology to politics, moral values and human welfare. But will progress end, either in catastrophe or completion - or will it continue infinitely? In this profound and seminal book, David Deutsch explores the furthest reaches of our current understanding, taking in the Infinity Hotel, supernovae and the nature of optimism, to instill in all of us a wonder at what we have achieved - and the fact that this is only the beginning of humanity's infinite possibility. 'This is Deutsch at his most ambitious, seeking to understand the implications of our scientific explanations of the world ... I enthusiastically recommend this rich, wide-ranging and elegantly written exposition of the unique insights of one of our most original intellectuals' Michael Berry, Times Higher Education Supplement 'Bold ... profound ... provocative and persuasive' Economist 'David Deutsch may well go down in history as one of the great scientists of our age' Scotsman

All the Mathematics You Missed Springer Science & Business Media

Winner of the 1983 National Book Award! "...a perfectly marvelous book about the Queen of Sciences, from which one will get a real feeling for what mathematicians do and who they are. The exposition is clear and full of wit and humor..." - The New Yorker (1983 National Book Award edition) Mathematics has been a human activity for thousands of years. Yet only a few people from the vast population of users are professional mathematicians, who create, teach, foster, and apply it in a variety of situations. The authors of this book believe that it should be possible for these professional mathematicians to explain to non-professionals what they do, what they say they are doing, and why the world should support them at it. They also believe that mathematics should be taught to non-mathematics majors in such a way as to instill an appreciation of the power and beauty of mathematics. Many people from around the world have told the authors that they have done precisely that with the first edition and they have encouraged publication of this revised edition complete with exercises for helping students to demonstrate their understanding. This edition of the book should find a new generation of general readers and students who would like to know what mathematics is all about. It will prove invaluable as a course text for a general mathematics appreciation course, one in which the student can combine an appreciation for the esthetics with some satisfying and revealing applications. The text is ideal for 1) a GE course for Liberal Arts students 2) a Capstone course for perspective teachers 3) a writing course for mathematics teachers. A wealth of customizable online course materials for the book can be obtained from Elena Anne Marchisotto (elena.marchisotto@csun.edu) upon request.

A Mathematician's Lament SIAM

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

Mathematical Methods in Linguistics American Mathematical Society

Mathematica Cookbook helps you master the application's core principles by walking you through real-world problems. Ideal for browsing, this book includes recipes for working with numerics, data structures, algebraic equations, calculus, and statistics. You'll also venture into exotic territory with recipes for data visualization using 2D and 3D graphic tools, image processing, and music. Although Mathematica 7 is a highly advanced computational platform, the recipes in this book make it accessible to everyone -- whether you're working on high school algebra, simple graphs, PhD-level computation, financial analysis, or advanced engineering models. Learn how to use Mathematica at a higher level with functional programming and pattern matching Delve into the rich library of functions for string and structured text manipulation Learn how to apply the tools to physics and engineering problems Draw on Mathematica's access to physics, chemistry, and biology data Get techniques for solving equations in computational finance Learn how to use Mathematica for sophisticated image processing Process music and audio as musical notes, analog waveforms, or digital sound samples

Recurrence Sequences John Wiley & Sons

A detailed exposition of the theory with an emphasis on its combinatorial aspects.

What Every Real Estate Investor Needs to Know About Cash Flow... And 36 Other Key Financial Measures, Updated Edition Cengage Learning

Number theory is one of the few areas of mathematics where problems of substantial interest can be fully described to someone with minimal mathematical background. Solving such problems sometimes requires difficult and deep methods. But this is not a universal phenomenon; many engaging problems can be successfully attacked with little more than one's mathematical bare hands. In this case one says that the problem can be solved in an elementary way. Such elementary methods and the problems to which they apply are the subject of this book. Not Always Buried Deep is designed to be read and enjoyed by those who wish to explore elementary methods in modern number theory. The heart of the book is a thorough introduction to elementary prime number theory, including Dirichlet's theorem on primes in arithmetic progressions, the Brun sieve, and the Erdos-Selberg proof of the prime number theorem. Rather than trying to present a comprehensive treatise, Pollack focuses on topics that are particularly attractive and accessible. Other topics covered include Gauss's theory of cyclotomy and its applications to rational reciprocity laws, Hilbert's solution to Waring's problem, and modern work on perfect numbers. The nature of the material means that little is required in terms of prerequisites: The reader is expected to have prior familiarity with number theory at the level of an undergraduate course and a first course in modern algebra (covering groups, rings, and

fields). The exposition is complemented by over 200 exercises and 400 references.

<u>Mathematics Under the Microscope</u> Oxford University Press

Take an apple and cut it into five pieces. Would you believe that these five pieces can be reassembled in such a fashion so as to create two apples equal in shape and size to the original? Would you believe that you could make something as large as the sun by breaking a pea into a finite number of pieces and putting it back together again? Neither did Leonard Wapner, author of The Pea and the Sun, when he was first introduced to the Banach-Tarski paradox, which asserts exactly such a notion. Written in an engaging style, The Pea and the Sun catalogues the people, events, and mathematics that contributed to the discovery of Banach and Tarski's magical paradox. Wapner makes one of the most interesting problems of advanced mathematics accessible to the non-mathematician.

The Butterfly in the Quantum World Oxford University Press, USA

'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 Beginning of Infinity "O'Reilly Media, Inc."

Elementary set theory accustoms the students to mathematical abstraction, includes the standard constructions of relations, functions, and orderings, and leads to a discussion of the various orders of infinity. The material on logic covers not only the standard statement logic and first-order predicate logic but includes an introduction to formal systems, axiomatization, and model theory. The section on algebra is presented with an emphasis on lattices as well as Boolean and Heyting algebras. Background for recent research in natural language semantics includes sections on lambda-abstraction and generalized quantifiers. Chapters on automata theory and formal languages contain a discussion of languages between context-free and context-sensitive and form the background for much current work in syntactic theory and computational linguistics. The many exercises not only reinforce basic skills but offer an entry to linguistic applications of mathematical concepts. For upper-level undergraduate students and graduate students in theoretical linguistics, computer-science students with interests in computational linguistics, logic programming and artificial intelligence, mathematicians and logicians with interests in linguistics and the semantics of natural language.

Machine Proofs in Geometry McGraw Hill Professional

Becoming someone is a learning process; and what we learn is the new values around which, if we succeed, our lives will come to turn. Agents transform themselves in the process of, for example, becoming parents, embarking on careers, or acquiring a passion for music or politics. How can such activity be rational, if the reason for engaging in the relevant pursuit is only available to the person one will become? How is it psychologically possible to feel the attraction of a form of concern that is not yet one's own? How can the work done to arrive at the finish line be ascribed to one who doesn't (really) know what one is doing, or why one is doing it? In Aspiration, Agnes Callard asserts that these questions belong to the theory of aspiration. Aspirants are motivated by proleptic reasons, acknowledged defective versions of the reasons they expect to eventually grasp. The psychology of such a transformation is marked by intrinsic conflict between their old point of view on value and the one they are trying to acquire. They cannot adjudicate this conflict by deliberating or choosing or deciding-rather, they resolve it by working to see the world in a new way. This work has a teleological structure: by modeling oneself on the person he or she is trying to be, the aspirant brings that person into being. Because it is open to us to engage in an activity of self-creation, we are responsible for having become the kinds of people we are.

<u>Mathematica Cookbook</u> Springer Science & Business Media

The unusual format of a series of discussions among a logician, a computer scientist, a philosopher and some researchers from other disciplines encourages the reader to develop his own point of view. --Book Jacket.

How to Prove It Cambridge University Press

This title is part of UC Press's Voices Revived program, which commemorates University of California Press's mission to seek out and cultivate the brightest minds and give them voice, reach, and impact. Drawing on a backlist dating to 1893, Voices Revived makes high-quality, peer-reviewed scholarship accessible once again using print-on-demand technology. This title was originally published in 1934.

<u>Euler</u> American Mathematical Soc.

Paperback version of the 2002 paper published in the journal Progress in Information, Complexity, and Design (PCID). ABSTRACT Inasmuch as science is observational or perceptual in nature, the goal of providing a scientific model and mechanism for the evolution of complex systems ultimately requires a supporting theory of reality of which perception itself is the model (or theory-to-universe mapping). Where information is the abstract currency of perception, such a theory must incorporate the theory of information while extending the information concept to incorporate reflexive self-processing in order to achieve an intrinsic (self-contained) description of reality. This extension is associated with a limiting formulation of model theory identifying mental and physical reality, resulting in a reflexively self-generating, self-modeling theory of reality identical to its universe on the syntactic level. By the nature of its derivation, this theory, the Cognitive Theoretic Model of the Universe or CTMU, can be regarded as a supertautological reality-theoretic extension of logic. Uniting the theory of reality with an advanced form of computational language theory, the CTMU describes reality as a Self Configuring Self-Processing Language or SCSPL, a reflexive intrinsic language characterized not only by self-reference and recursive self-definition, but full self-configuration and self-execution (reflexive read-write functionality). SCSPL reality embodies a dual-aspect monism consisting of infocognition, self-transducing information residing in self-recognizing SCSPL elements called syntactic operators. The CTMU identifies itself with the structure of these operators and thus with the distributive syntax of its self-modeling SCSPL universe, including the reflexive grammar by which the universe refines itself from unbound telesis or UBT, a primordial realm of infocognitive potential free of informational constraint. Under the guidance of a limiting (intrinsic) form of anthropic principle called the Telic Principle, SCSPL evolves by telic recursion, jointly configuring syntax and state while maximizing a generalized self-selection parameter and adjusting on the fly to freely-changing internal conditions. SCSPL relates space, time and object by means of conspansive duality and conspansion, an SCSPL-grammatical process featuring an alternation between dual phases of existence associated with design and actualization and related to the familiar wave-particle duality of quantum mechanics. By distributing the design phase of reality over the actualization phase, conspansive spacetime also provides a distributed mechanism for Intelligent Design, adjoining to the restrictive principle of natural selection a basic means of generating information and complexity. Addressing physical evolution on not only the biological but cosmic level, the CTMU addresses the most evident deficiencies and paradoxes associated with conventional discrete and continuum models of reality, including temporal directionality and accelerating cosmic expansion, while preserving virtually all of the major benefits of current scientific and mathematical paradigms.

The Mathematical Experience, Study Edition Penguin

"This beautiful little book is certainly suitable for anyone who has had an introductory course in physics and even for some who have not."—Joshua N. Goldberg, Physics Today "An imaginative and convincing new presentation of Einstein's theory of general relativity. . . . The treatment is masterful, continual emphasis being placed on careful discussion and motivation, with the aim of showing how physicists think and develop their ideas."—Choice

Surfing Uncertainty Springer Science & Business Media

This book reports recent major advances in automated reasoning in geometry. The authors have developed a method and implemented a computer program which, for the first time, produces short and readable proofs for hundreds of geometry theorems.The book begins with chapters introducing the method at an elementary level, which are accessible to high school students; latter chapters concentrate on the main theme: the algorithms and computer implementation of the method.This book brings researchers in artificial intelligence, computer science and mathematics to a new research frontier of automated geometry reasoning. In addition, it can be used as a supplementary geometry textbook for students, teachers and geometers. By presenting a systematic way of proving geometry theorems, it makes the learning and teaching of geometry easier and may change the way of geometry education.

<u>Pound Foolish</u> Oxford University Press

This book discusses 24 unsolved problems in number theory and geometry.

Mathematics for Computer Science University of Chicago Press

Butterfly in the Quantum World by Indu Satija, with contributions by Douglas Hofstadter, is the first book ever to tell the story of the "Hofstadter butterfly", a beautiful and fascinating graph lying at the heart of the quantum theory of matter. The butterfly came out of a simple-sounding question: What happens if you immerse a crystal in a magnetic field? What energies can the electrons take on? From 1930 onwards, physicists struggled to answer this question, until 1974, when graduate student Douglas Hofstadter discovered that the answer was a graph consisting of nothing but copies of itself nested down infinitely many times. This wild mathematical object caught the physics world totally by surprise, and it continues to mesmerize physicists and mathematicians today. The butterfly plot is intimately related to many other important phenomena in number theory and physics, including Apollonian gaskets, the Foucault pendulum, quasicrystals, the quantum Hall effect, and many more. Its story reflects the magic, the mystery, and the simplicity of the laws of nature, and Indu Satija, in a wonderfully personal style, relates this story, enriching it with a vast number of lively historical anecdotes, many photographs, beautiful visual images, and even poems, making her book a great feast, for the eyes, for the mind and for the soul.

The Pea and the Sun Mega Foundation Press

The Classic Guide to Real Estate Investing—Updated for a Re-energized Industry! Real estate is once again a great investment, and this bestselling guide provides everything you need to know to get in now and make your fortune. What Every Real Estate Investor Needs to Know About Cash Flow removes the guesswork from investing in real estate by teaching you how to crunch numbers like a pro, so you can confidently judge a property's value and ensure it provides long-term returns. Real estate expert, Frank Gallinelli has added new, detailed investment case studies, while maintaining the essentials that have made his book a staple among serious investors. Learn how to measure critical aspects of real estate investments, including: Discounted Cash Flow Net Present Value Capitalization Rate Cash-on-Cash Return Net Operating Income Internal Rate of Return Profitability Index Return on Equity Whether you're just beginning in real estate investing or you're a seasoned professional, What Every Real Estate Investor Needs to Know About Cash Flow has what you need to make sure you take the smartest approach for your next investment using proven calculations.