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KEY=STEWART - MOLLY SWEENEY

Concepts of Modern Mathematics

Courier Corporation In this charming volume, a noted English mathematician uses humor and anecdote to illuminate the concepts of groups, sets, subsets, topology, Boolean algebra, and other mathematical subjects. 200 illustrations.

The Foundations of Mathematics

Oxford University Press on Demand "There are many textbooks available for a so-called transition course from calculus to abstract mathematics. I have taught this course several times and always find it problematic. The Foundations of Mathematics (Stewart and Tall) is a horse of a different color. The writing is excellent and there is actually some useful mathematics. I definitely like this book."-- The Bulletin of Mathematics Books

What is Mathematics?

An Elementary Approach to Ideas and Methods

Complex Analysis

Cambridge University Press A new edition of a classic textbook on complex analysis with an emphasis on translating visual intuition to rigorous proof.

The Mathematics of Life

Basic Books Biologists have long dismissed mathematics as being unable to meaningfully contribute to our understanding of living beings. Within the past ten years, however, mathematicians have proven that they hold the key to unlocking the mysteries of our world -- and ourselves. In The Mathematics of Life, Ian Stewart provides a fascinating overview of the vital but little-recognized role mathematics has played in pulling back the curtain on the hidden complexities of the natural world -- and how its contribution will be even more vital in the years ahead. In his characteristically clear and entertaining fashion, Stewart explains how mathematicians and biologists have come to work together on some of the most difficult scientific problems that the human race has ever tackled, including the nature and origin of life itself.

Professor Stewart's Casebook of Mathematical Mysteries

Basic Books In Professor Stewart's Casebook of Mathematical Mysteries, acclaimed mathematician Ian Stewart presents an enticing collection of mathematical curios and conundrums. With a new puzzle on each page, this compendium of brainteasers will both teach and delight. Guided by stalwart detective Hemlock Soames and his sidekick, Dr. John Watsup, readers will delve into almost two hundred mathematical problems, puzzles, and facts. Tackling subjects from mathematical dates (such as Pi Day), what we don't know about primes, and why the Earth is round, this clever, mind-expanding book demonstrates the power and fun inherent in mathematics.

Partial Differential Equations

An Introduction

John Wiley & Sons Partial Differential Equations presents a balanced and comprehensive introduction to the concepts and techniques required to solve problems containing unknown functions of multiple variables. While focusing on the three most classical partial differential equations (PDEs)—the wave, heat, and Laplace equations—this detailed text also presents a broad practical perspective that merges mathematical concepts with real-world application in diverse areas including molecular structure, photon and electron interactions, radiation of electromagnetic waves, vibrations of a solid, and many more. Rigorous pedagogical tools aid in student comprehension; advanced topics are introduced frequently, with minimal technical jargon, and a wealth of exercises reinforce vital skills and invite additional self-study. Topics are presented in a logical progression, with major concepts such as wave propagation, heat and diffusion, electrostatics, and quantum mechanics placed in contexts familiar to students of various fields in science and engineering. By understanding the properties and applications of PDEs, students will be equipped to better analyze and interpret central processes of the natural world.

Professor Stewart's Incredible Numbers

Basic Books At its heart, mathematics is about numbers, our fundamental tools for understanding the world. In Professor Stewart's Incredible Numbers, Ian Stewart offers a delightful introduction to the numbers that surround us, from the common (Pi and 2) to the uncommon but no less consequential (1.059463 and 43,252,003,274,489,856,000). Along the way, Stewart takes us through prime numbers, cubic equations, the concept of zero, the possible positions on the Rubik's Cube, the role of numbers in human history, and beyond! An unfailingly genial guide, Stewart brings his characteristic wit and erudition to bear on these incredible numbers, offering an engaging primer on the principles and power of math.

Taming the Infinite

Quercus From ancient Babylon to the last great unsolved problems, Ian Stewart brings us his definitive history of mathematics. In his famous straightforward style, Professor Stewart explains each major development--from the first number systems to chaos theory--and considers how each affected society and changed everyday life forever. Maintaining a personal touch, he introduces all of the outstanding mathematicians of history, from the key Babylonians, Greeks and Egyptians, via Newton and Descartes, to Fermat, Babbage and Godel, and demystifies math's key concepts without recourse to complicated formulae. Written to provide a captivating historic narrative for the non-mathematician, Taming the Infinite is packed with fascinating nuggets and quirky asides, and contains 100 illustrations and diagrams to illuminate and aid understanding of a subject many dread, but which has made our world what it is today.

The Foundations of Mathematics

Mathematical logic grew out of philosophical questions regarding the foundations of mathematics, but logic has now outgrown its philosophical roots, and has become an integral part of mathematics in general. This book is designed for students who plan to specialize in logic, as well as for those who are interested in the applications of logic to other areas of mathematics. Used as a text, it could form the basis of a beginning graduate-level course. There are three main chapters: Set Theory, Model Theory, and Recursion Theory. The Set Theory chapter describes the set-theoretic foundations of all of mathematics, based on the ZFC axioms. It also covers technical results about the Axiom of Choice, well-orderings, and the theory of uncountable cardinals. The Model Theory chapter discusses predicate logic and formal proofs, and covers the Completeness, Compactness, and Lowenheim-Skolem Theorems, elementary submodels, model completeness, and applications to algebra. This chapter also continues the foundational issues begun in the set theory chapter. Mathematics can now be viewed as formal proofs from ZFC. Also, model theory leads to models of set theory. This includes a discussion of absoluteness, and an analysis of models such as $H(\aleph_1)$ and $R(\aleph_1)$. The Recursion Theory chapter develops some basic facts about computable functions, and uses them to prove a number of results of foundational importance; in particular, Church's theorem on the undecidability of logical consequence, the incompleteness theorems of Godel, and Tarski's theorem on the non-definability of truth.

Advanced Calculus

Revised

World Scientific Publishing Company An authorised reissue of the long out of print classic textbook, Advanced Calculus by the late Dr Lynn Loomis and Dr Shlomo Sternberg both of Harvard University has been a revered but hard to find textbook for the advanced calculus course for decades. This book is based on an honors course in advanced calculus that the authors gave in the 1960's. The foundational material, presented in the unstarred sections of Chapters 1 through 11, was normally covered, but different applications of this basic material were stressed from year to year, and the book therefore contains more material than was covered in any one year. It can accordingly be used (with omissions) as a text for a year's course in advanced calculus, or as a text for a three-semester introduction to analysis. The prerequisites are a good grounding in the calculus of one variable from a mathematically rigorous point of view, together with some acquaintance with linear algebra. The reader should be familiar with limit and continuity type arguments and have a certain amount of mathematical sophistication. As possible introductory texts, we mention Differential and Integral Calculus by R Courant, Calculus by T Apostol, Calculus by M Spivak, and Pure Mathematics by G Hardy. The reader should also have some experience with partial derivatives. In overall plan the book divides roughly into a first half which develops the calculus

(principally the differential calculus) in the setting of normed vector spaces, and a second half which deals with the calculus of differentiable manifolds.

A Gateway To Modern Mathematics Vol-1

A Gateway to Modern Mathematics: Adventures in Iteration I is the first of a two-volume work on iterations in the RMS series Little Mathematical Treasures. The books in this series address senior secondary school students who are interested in exploring mathematics a little beyond what the school curriculum offers. Iterations is an exciting topic of study and should interest both the amateur as well as the professional. Many of the iterations in elementary mathematics offer scope for extended investigation. They are like a gateway to important themes of modern mathematics such as fractals and chaos and offer a route for experiencing the experimental and visually aesthetic side of mathematics. This book, which is at an elementary level, introduces the idea of iteration. It also explores various associated notions like fixed points, orbits, cycles, limit points, convergence, solution of equations and cobwebbing. It contains a large number of illustrative examples from the world of arithmetic, algebra and geometry. Students preparing for the mathematical Olympiads will benefit from a study of the book, and teachers who run mathematics clubs will find here a rich source of material.

A Course of Modern Analysis

An Introduction to the General Theory of Infinite Series and of Analytic Functions, with an Account of the Principal Transcendental Functions

Thomas' Calculus

Pearson Education India

What is Mathematics?

An Elementary Approach to Ideas and Methods

Oxford University Press, USA A discussion of fundamental mathematical principles from algebra to elementary calculus designed to promote constructive mathematical reasoning.

Calculus on Manifolds

A Modern Approach to Classical Theorems of Advanced Calculus

Westview Press This book uses elementary versions of modern methods found in sophisticated mathematics to discuss portions of "advanced calculus" in which the subtlety of the concepts and methods makes rigor difficult to attain at an elementary level.

Five Equations That Changed the World

The Power and Poetry of Mathematics

Hachette Books A Publishers Weekly best book of 1995! Dr. Michael Guillen, known to millions as the science editor of ABC's Good Morning America, tells the fascinating stories behind five mathematical equations. As a regular contributor to daytime's most popular morning news show and an instructor at Harvard University, Dr. Michael Guillen has earned the respect of millions as a clear and entertaining guide to the exhilarating world of science and mathematics. Now Dr. Guillen unravels the equations that have led to the inventions and events that characterize the modern world, one of which -- Albert Einstein's famous energy equation, $E=mc^2$ -- enabled the creation of the nuclear bomb. Also revealed are the mathematical foundations for the moon landing, airplane travel, the electric generator -- and even life itself. Praised by Publishers Weekly as "a wholly accessible, beautifully written exploration of the potent mathematical imagination," and named a Best Nonfiction Book of 1995, the stories behind The Five Equations That Changed the World, as told by Dr. Guillen, are not only chronicles of science, but also gripping dramas of jealousy, fame, war, and discovery.

Fundamentals of Mathematical Statistics

Sultan Chand & Sons Knowledge updating is a never-ending process and so should be the revision of an effective textbook. The book originally written fifty years ago has, during the intervening period, been revised and reprinted several times. The authors have, however, been thinking, for the last few years that the book needed not only a thorough revision but rather a substantial rewriting. They now take great pleasure in presenting to the readers the twelfth, thoroughly revised and enlarged, Golden Jubilee edition of the book. The subject-matter in the entire book has been re-written in the light of numerous criticisms and suggestions received from the users of the earlier editions in India and abroad. The basis of this revision has been the emergence of new literature on the subject, the constructive feedback from students and teaching fraternity, as well as those changes that have been made in the syllabi and/or the pattern of examination papers of numerous universities. Knowledge updating is a never-ending process and so should be the revision of an effective textbook. The book originally written fifty years ago has, during the intervening period, been revised and reprinted several times. The authors have, however, been thinking, for the last few years that the book needed not only a thorough revision but rather a substantial rewriting. They now take great pleasure in presenting to the readers the twelfth, thoroughly revised and enlarged, Golden Jubilee edition of the book. The subject-matter in the entire book has been re-written in the light of numerous criticisms and suggestions received from the users of the earlier editions in India and abroad. The basis of this revision has been the emergence of new literature on the subject, the constructive feedback from students and teaching fraternity, as well as those changes that have been made in the syllabi and/or the pattern of examination papers of numerous universities. Some prominent additions are given below: 1. Variance of Degenerate Random Variable 2. Approximate Expression for Expectation and Variance 3. Lyapounov's Inequality 4. Holder's Inequality 5. Minkowski's Inequality 6. Double Expectation Rule or Double-E Rule and many others

From Here to Infinity

Oxford Paperbacks A retitled and revised edition of Ian Stewart's The Problem of Mathematics, this is the perfect guide to today's mathematics. Read about the latest discoveries, including Andrew Wile's amazing proof of Fermat's Last Theorem, the newest advances in knot theory, the Four Colour Theorem, Chaos Theory, and fake four-dimensional spaces. See how simple concepts from probability theory shed light on the National Lottery and tell you how to maximize your winnings. Discover how infinitesimals become respectable, why there are different kinds of infinity, and how to square the circle with the mathematical equivalent of a pair of scissors.

Flatterland

Like Flatland, Only More So

ReadHowYouWant.com First there was Edwin A. Abbott's remarkable Flatland, published in 1884, and one of the all-time classics of popular mathematics. Now, from mathematician and accomplished science writer Ian Stewart, comes what Nature calls "a superb sequel." Through larger-than-life characters and an inspired story line, Flatterland explores our present understanding of the shape and origins of the universe, the nature of space, time, and matter, as well as modern geometries and their applications. The journey begins when our heroine, Victoria Line, comes upon her great-great-grandfather A. Square's diary, hidden in the attic. The writings help her to contact the Space Hopper, who tempts her away from her home and family in Flatland and becomes her guide and mentor through ten dimensions. In the tradition of Alice in Wonderland and The Phantom Toll Booth, this magnificent investigation into the nature of reality is destined to become a modern classic.

Algebraic Number Theory and Fermat's Last Theorem

Third Edition

CRC Press First published in 1979 and written by two distinguished mathematicians with a special gift for exposition, this book is now available in a completely revised third edition. It reflects the exciting developments in number theory during the past two decades that culminated in the proof of Fermat's Last Theorem. Intended as an upper level textbook, it

A Beautiful Math

John Nash, Game Theory, and the Modern Quest for a Code of Nature

National Academies Press Millions have seen the movie and thousands have read the book but few have fully appreciated the mathematics developed by John Nash's beautiful mind. Today Nash's beautiful math has become a universal language for research in the social sciences and has infiltrated the realms of evolutionary biology, neuroscience, and even quantum physics. John Nash won the 1994 Nobel Prize in economics for pioneering research published in the 1950s on a new branch of mathematics known as game theory. At the time of Nash's early work, game theory was briefly popular among some mathematicians and Cold War analysts. But it remained obscure until the 1970s when evolutionary biologists began applying it to their work. In the 1980s economists began to embrace game theory. Since then it has found an ever expanding repertoire of applications among a wide range of scientific disciplines. Today neuroscientists peer into game players' brains, anthropologists play games with people from primitive cultures, biologists use games to explain the evolution of human language, and mathematicians exploit games to better understand social networks. A common thread connecting much of this research is its relevance to the ancient quest for a science of human social behavior, or a Code of Nature, in the spirit of the fictional science of psychohistory described in the famous Foundation novels by the late Isaac Asimov. In A Beautiful Math, acclaimed science writer Tom Siegfried describes how game theory links the life sciences, social sciences, and physical sciences in a way that may bring Asimov's dream closer to reality.

Nature's Numbers

The Unreal Reality Of Mathematics

Basic Books "It appears to us that the universe is structured in a deeply mathematical way. Falling bodies fall with predictable accelerations. Eclipses can be accurately forecast centuries in advance. Nuclear power plants generate electricity according to well-known formulas. But those examples are the tip of the iceberg. In Nature's Numbers, Ian Stewart presents many more, each charming in its own way.. Stewart admirably captures compelling and accessible mathematical ideas along with the pleasure of thinking of them. He writes with clarity and precision. Those who enjoy this sort of thing will love this book."—Los Angeles Times

Modern Robotics

Cambridge University Press A modern and unified treatment of the mechanics, planning, and control of robots, suitable for a first course in robotics.

Handbook of the Mathematics of the Arts and Sciences

Springer The goal of this Handbook is to become an authoritative source with chapters that show the origins, unification, and points of similarity between different disciplines and mathematics. Some chapters will also show bifurcations and the development of disciplines which grow to take on a life of their own. Science and Art are used as umbrella terms to encompass the physical, natural and geological sciences, as well as the visual and performing arts. As arts imagine possibilities, science attempts to generate models to test possibilities, mathematics serves as the tool. This handbook is an indispensable collection to understand today's effort to build bridges between disciplines. It answers questions such as: What are the origins of interdisciplinarity in mathematics? What are cross-cultural components of interdisciplinarity linked to mathematics? What are contemporary interdisciplinary trends? Section Editors: Michael J. Ostwald, University of Newcastle (Australia) Kyeong-Hwa Lee, Seoul National University (South Korea) Torsten Lindström, Linnaeus University (Sweden) Gizem Karaali, Pomona College (USA) Ken Valente, Colgate University, (USA) Consulting Editors: Alexandre Borovik, Manchester University (UK) Daina Taimina, Independent Scholar, Cornell University (USA) Nathalie Sinclair, Simon Fraser University (Canada) What do figure skating, invasive species, medieval cathedrals, ropes, poems, wines, metaphors, rhythms, climate change, and origami have in common? Mathematics! The Handbook of the Mathematics of the Arts and Sciences is a stunning compendium of essays on these and scores of other unlikely subjects to which the mathematical imagination has been brought. It is at once a dazzlingly contemporary tour of human success at bringing order to the world, and a throwback to a time before the "unity of knowledge" became a mere slogan. It is a breathtaking work, for its ambitious scope and for its endless stimulation of the reader's curiosity. - Harry R. Lewis, Gordon McKay Research Professor of Computer Science at Harvard University, editor of Ideas That Created the Future: Classic Papers of Computer Science Mathematics has always enjoyed deep connections with the arts, science, the humanities, philosophy, history, and society in general. However, these links are often overlooked or undervalued. This Handbook makes a massive statement about the extent and importance of the interdisciplinary nature of mathematics, and its relevance to all aspects of human culture. Its articles are scholarly and authoritative, but also highly readable and accessible to non-specialists. A triumph! -Ian Stewart FRS, Emeritus Professor - University of Warwick This handbook will delight anyone who loves the richness of mathematics and its interplay with the arts and humanities. Bharath Sriraman has given us a great gift, a treasure chest of connections to art and architecture, language and literature, philosophy, history, society, you name it. The book is authoritative and charming and instantly establishes itself as a landmark reference for interdisciplinary mathematics. Steven Strogatz - Jacob Gould Schurman Professor of Applied Mathematics at Cornell University.

College Physics

Breton Publishing Company

Calculus

Wellesley-Cambridge Press Gilbert Strang's clear, direct style and detailed, intensive explanations make this textbook ideal as both a course companion and for self-study. Single variable and multivariable calculus are covered in depth. Key examples of the application of calculus to areas such as physics, engineering and economics are included in order to enhance students' understanding. New to the third edition is a chapter on the 'Highlights of calculus', which accompanies the popular video lectures by the author on MIT's OpenCourseWare. These can be accessed from math.mit.edu/~gs.

Significant Figures

The Lives and Work of Great Mathematicians

Basic Books A celebrated mathematician traces the history of math through the lives and work of twenty-five pioneering mathematicians In *Significant Figures*, acclaimed mathematician Ian Stewart introduces the visionaries of mathematics throughout history. Delving into the lives of twenty-five great mathematicians, Stewart examines the roles they played in creating, inventing, and discovering the mathematics we use today. Through these short biographies, we get acquainted with the history of mathematics from Archimedes to Benoit Mandelbrot, and learn about those too often left out of the cannon, such as Muhammad ibn Musa al-Khwarizmi (c. 780-850), the creator of algebra, and Augusta Ada King (1815-1852), Countess of Lovelace, the world's first computer programmer. Tracing the evolution of mathematics over the course of two millennia, *Significant Figures* will educate and delight aspiring mathematicians and experts alike.

The Language of Mathematics

A Linguistic and Philosophical Investigation

Springer *The Language of Mathematics* was awarded the E.W. Beth Dissertation Prize for outstanding dissertations in the fields of logic, language, and information. It innovatively combines techniques from linguistics, philosophy of mathematics, and computation to give the first wide-ranging analysis of mathematical language. It focuses particularly on a method for determining the complete meaning of mathematical texts and on resolving technical deficiencies in all standard accounts of the foundations of mathematics. "The thesis does far more than is required for a PhD: it is more like a lifetime's work packed into three years, and is a truly exceptional achievement." Timothy Gowers

Modern Algebra

Courier Corporation Standard text provides an exceptionally comprehensive treatment of every aspect of modern algebra. Explores algebraic structures, rings and fields, vector spaces, polynomials, linear operators, much more. Over 1,300 exercises. 1965 edition.

The Number Sense

How the Mind Creates Mathematics, Revised and Updated Edition

OUP USA "Our understanding of how the human brain performs mathematical calculations is far from complete. In *The Number Sense*, Stanislas Dehaene offers readers an enlightening exploration of the mathematical mind. Using research showing that human infants have a rudimentary number sense, Dehaene suggests that this sense is as basic as our perception of color, and that it is wired into the brain. But how then did we leap from this basic number ability to trigonometry, calculus, and beyond? Dehaene shows that it was the invention of symbolic systems of numerals that started us on the climb to higher mathematics. Tracing the history of numbers, we learn that in early times, people indicated numbers by pointing to part of their bodies, and how Roman numerals were replaced by modern numbers. On the way, we also discover many fascinating facts: for example, because Chinese names for numbers are short, Chinese people can remember up to nine or ten digits at a time, while English-speaking people can only remember seven. A fascinating look at the crossroads where numbers and neurons intersect, *The Number Sense* offers an intriguing tour of how the structure of the brain shapes our mathematical abilities, and how math can open up a window on the human mind"--Provided by publisher.

Does God Play Dice

The New Mathematics of Chaos

Wiley-Blackwell The revised and updated edition includes three completely new chapters on the prediction and control of chaotic systems. It also incorporates new information regarding the solar system and an account of complexity theory. This witty, lucid and engaging book makes the complex mathematics of chaos accessible and entertaining. Presents complex mathematics in an accessible style. Includes three new chapters on prediction in chaotic systems, control of chaotic systems, and on the concept of chaos. Provides a discussion of complexity theory.

Basic Concepts in Modern Mathematics

Courier Corporation An in-depth overview of some of the most readily applicable essentials of modern mathematics, this concise volume is geared toward undergraduates of all backgrounds as well as future math majors. Topics include the natural numbers; sets, variables, and statement forms; mappings and operations; groups; relations and partitions; integers; and rational and real numbers. 1961 edition.

Flatland

A Romance of Many Dimensions

Courier Corporation Classic of science (and mathematical) fiction — charmingly illustrated by the author — describes the adventures of A. Square, a resident of Flatland, in Spaceland (three dimensions), Lineland (one dimension), and Pointland (no dimensions).

Advanced Engineering Mathematics

Pearson New International Edition

Appropriate for one- or two-semester Advanced Engineering Mathematics courses in departments of Mathematics and Engineering. This clear, pedagogically rich book develops a strong understanding of the mathematical principles and practices that today's engineers and scientists need to know. Equally effective as either a textbook or reference manual, it approaches mathematical concepts from a practical-use perspective making physical applications more vivid and substantial. Its comprehensive instructional framework supports a conversational, down-to-earth narrative style offering easy accessibility and frequent opportunities for application and reinforcement.

Mathematics Under the Microscope

Notes on Cognitive Aspects of Mathematical Practice

American Mathematical Soc. The author's goal is to start a dialogue between mathematicians and cognitive scientists. He discusses, from a working mathematician's point of view, the mystery of mathematical intuition: why are certain mathematical concepts more intuitive than others? To what extent does the "small scale" structure of mathematical concepts and algorithms reflect the workings of the human brain? What are the "elementary particles" of mathematics that build up the mathematical universe? The book is saturated with amusing examples from a wide range of disciplines--from turbulence to error-correcting codes to logic--as well as with just puzzles and brainteasers. Despite the very serious subject matter, the author's approach is lighthearted and entertaining. This is an unusual and unusually fascinating book. Readers who never thought about mathematics after their school years will be amazed to discover how many habits of mind, ideas, and even material objects that are inherently mathematical serve as building blocks of our civilization and everyday life. A professional mathematician, reluctantly breaking the daily routine, or pondering on some resisting problem, will open this book and enjoy a sudden return to his or her young days when mathematics was fresh, exciting, and holding all promises. And do not take the word "microscope" in the title too literally: in fact, the author looks around, in time and space, focusing in turn on a tremendous variety of motives, from mathematical "memes" (genes of culture) to an unusual life of a Hollywood star. --Yuri I. Manin, Max-Planck Institute of Mathematics, Bonn, and Northwestern University

The Great Mathematical Problems

Profile Books There are some mathematical problems whose significance goes beyond the ordinary - like Fermat's Last Theorem or Goldbach's Conjecture - they are the enigmas which define mathematics. The Great Mathematical Problems explains why these problems exist, why they matter, what drives mathematicians to incredible lengths to solve them and where they stand in the context of mathematics and science as a whole. It contains solved problems - like the Poincaré Conjecture, cracked by the eccentric genius Grigori Perelman, who refused academic honours and a million-dollar prize for his work, and ones which, like the Riemann Hypothesis, remain baffling after centuries. Stewart is the guide to this mysterious and exciting world, showing how modern mathematicians constantly rise to the challenges set by their predecessors, as the great mathematical problems of the past succumb to the new

techniques and ideas of the present.

Life's Other Secret

The New Mathematics of the Living World

Until the middle of this century, it was completely unclear whether life had any kind of inorganic basis. The discovery of the first secret of life, the molecular structure of DNA, solved that particular riddle.

Calculating the Cosmos

How Mathematics Unveils the Universe

*Basic Books A prize-winning popular science writer uses mathematical modeling to explain the cosmos. In *Calculating the Cosmos*, Ian Stewart presents an exhilarating guide to the cosmos, from our solar system to the entire universe. He describes the architecture of space and time, dark matter and dark energy, how galaxies form, why stars implode, how everything began, and how it's all going to end. He considers parallel universes, the fine-tuning of the cosmos for life, what forms extraterrestrial life might take, and the likelihood of life on Earth being snuffed out by an asteroid. Beginning with the Babylonian integration of mathematics into the study of astronomy and cosmology, Stewart traces the evolution of our understanding of the cosmos: How Kepler's laws of planetary motion led Newton to formulate his theory of gravity. How, two centuries later, tiny irregularities in the motion of Mars inspired Einstein to devise his general theory of relativity. How, eighty years ago, the discovery that the universe is expanding led to the development of the Big Bang theory of its origins. How single-point origin and expansion led cosmologists to theorize new components of the universe, such as inflation, dark matter, and dark energy. But does inflation explain the structure of today's universe? Does dark matter actually exist? Could a scientific revolution that will challenge the long-held scientific orthodoxy and once again transform our understanding of the universe be on the way? In an exciting and engaging style, *Calculating the Cosmos* is a mathematical quest through the intricate realms of astronomy and cosmology.*

An Invitation to Modern Number Theory

*Princeton University Press In a manner accessible to beginning undergraduates, *An Invitation to Modern Number Theory* introduces many of the central problems, conjectures, results, and techniques of the field, such as the Riemann Hypothesis, Roth's Theorem, the Circle Method, and Random Matrix Theory. Showing how experiments are used to test conjectures and prove theorems, the book allows students to do original work on such problems, often using little more than calculus (though there are numerous remarks for those with deeper backgrounds). It shows students what number theory theorems are used for and what led to them and suggests problems for further research. Steven Miller and Ramin Takloo-Bighash introduce the problems and the computational skills required to numerically investigate them, providing background material (from probability to statistics to Fourier analysis) whenever necessary. They guide students through a variety of problems, ranging from basic number theory, cryptography, and Goldbach's Problem, to the algebraic structures of numbers and continued fractions, showing connections between these subjects and encouraging students to study them further. In addition, this is the first undergraduate book to explore Random Matrix Theory, which has recently become a powerful tool for predicting answers in number theory. Providing exercises, references to the background literature, and Web links to previous student research projects, *An Invitation to Modern Number Theory* can be used to teach a research seminar or a lecture class.*