

## The Mathematics Of Life Ian Stewart

"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

How filling life with play—whether soccer or lawn mowing, counting sheep or tossing Angry Birds -- forges a new path for creativity and joy in our impatient age

Life is boring: filled with meetings and traffic, errands and emails. Nothing we'd ever call fun. But what if we've gotten fun wrong? In *Play Anything*, visionary game designer and philosopher Ian Bogost shows how we can overcome our daily anxiety; transforming the boring, ordinary world around us into one of endless, playful possibilities. The key to this playful mindset lies in discovering the secret truth of fun and games. *Play Anything*, reveals that games appeal to us not because they are fun, but because they set limitations. Soccer wouldn't be

soccer if it wasn't composed of two teams of eleven players using only their feet, heads, and torsos to get a ball into a goal; Tetris wouldn't be Tetris without falling pieces in characteristic shapes. Such rules seem needless, arbitrary, and difficult. Yet it is the limitations that make games enjoyable, just like it's the hard things in life that give it meaning. Play is what happens when we accept these limitations, narrow our focus, and, consequently, have fun. Which is also how to live a good life. Manipulating a soccer ball into a goal is no different than treating ordinary circumstances- like grocery shopping, lawn mowing, and making PowerPoints-as sources for meaning and joy. We can "play anything" by filling our days with attention and discipline, devotion and love for the world as it really is, beyond our desires and fears. Ranging from Internet culture to moral philosophy, ancient poetry to modern consumerism, Bogost shows us how today's chaotic world can only be tamed-and enjoyed-when we first impose boundaries on ourselves. 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. Opening another drawer in his Cabinet of Curiosities, renowned mathematics professor Ian Stewart presents a new medley of games, paradoxes, and riddles in Professor Stewart's Hoard of Mathematical Treasures. With wit and aplomb, Stewart mingles casual puzzles with grander forays into ancient and modern mathematical thought. Amongst a host of arcane and astonishing facts about every kind of number from irrational and imaginary to complex and cuneiform, we learn: – How to organize chaos – How matter balances anti-matter – How to turn a sphere inside out (without creasing it) – How to calculate pi by observing the stars – ...and why you can't comb a hairy ball. Along the way Stewart offers the reader tantalizing glimpses of the mathematics underlying life and the universe. Mind-stretching, enlightening, and endlessly amusing, Professor Stewart's Hoard of Mathematical Treasures will stimulate, delight, and enthrall.

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.

"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

Which mathematician elaborated a crucial concept the night before he died in a duel? Who funded his maths and medical career through gambling and chess? Who learned maths from her wallpaper? Ian Stewart presents the extraordinary lives and amazing discoveries of twenty-five of history's greatest mathematicians from Archimedes and Liu Hui to Benoit Mandelbrot and William Thurston. His subjects are the inspiring individuals from all over the world who have made crucial contributions to mathematics. They include the rediscovered geniuses Srinivasa Ramanujan and Emmy Noether, alongside the towering figures of Muhammad al-Khwarizmi (inventor of the algorithm), Pierre de Fermat, Isaac Newton, Carl Friedrich Gauss, Nikolai Ivanovich Lobachevsky, Bernhard

Reimann (precursor to Einstein), Henri Poincar, Ada Lovelace (arguably the first computer programmer), Kurt Gdel and Alan Turing. Ian Stewart's vivid accounts are fascinating in themselves and, taken together, cohere into a riveting history of key steps in the development of mathematics.

Think of a zebra's stripes, the complexities of a spider's web, the uniformity of desert dunes, or the spirals in a sunflower head ... think of a snowflake. The Beauty of Numbers in Nature shows how life on Earth forms the principles of mathematics. Starting with the simplest patterns, each chapter looks at a different kind of patterning system and the mathematics that underlies it. In doing so the book also uncovers some universal patterns, both in nature and man-made, from the basic geometry of ancient Greece to the visually startling fractals that we are familiar with today. Elegantly illustrated, The Beauty of Numbers in Nature is an illuminating and engaging vision of how the apparently cold laws of mathematics find expression in the beauty of nature.

Physics.

A professor of mathematics presents an overview of the role mathematics plays in revealing the hidden complexities of the natural world and explains how mathematicians and biologists now work together on difficult scientific problems, including the nature and origin of life.

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Explains how Billy Beene, the general manager of the Oakland Athletics, is using a new kind of thinking to build a successful and winning baseball team without spending enormous sums of money.

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.

A new partnership of biologists and mathematicians is picking apart the hidden complexity of animals and plants to throw fresh light on the behaviour of entire organisms, how they interact and how changes in biological diversity affect the planet's ecological balance. Mathematics offers new and sometimes startling perspectives on evolution and how patterns of inheritance and population work out over time-scales ranging from millions to hundreds of years - as well as what's going on to change us

right now. Ian Stewart, in characteristically clear and entertaining fashion, explores these and a whole range of pertinent issues, including how far genes control behaviour and the nature of life itself. He shows how far mathematicians and biologists are succeeding in tackling some of the most difficult scientific problems the human race has ever confronted and where their research is currently taking us.

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, *Flatter land* 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.

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Uncertainty is everywhere. It lurks in every consideration of the future - the weather, the economy, the sex of an unborn child - even quantities we think that we know such as populations or the transit of the planets contain the possibility of error. It's no wonder that, throughout that history, we have attempted to produce rigidly defined areas of uncertainty - we prefer the surprise party to the surprise asteroid. We began our quest to make certain an uncertain world by reading omens in livers, tea leaves, and the stars. However, over the centuries, driven by curiosity, competition, and a desire be better gamblers, pioneering mathematicians and scientists began to reduce wild uncertainties to tame distributions of probability and statistical inferences. But, even as unknown unknowns became known unknowns, our pessimism made us believe that some problems were unsolvable and our intuition misled us. Worse, as we realized how omnipresent and varied uncertainty is, we encountered chaos, quantum mechanics,



and the limitations of our predictive power. Bestselling author Professor Ian Stewart explores the history and mathematics of uncertainty. Touching on gambling, probability, statistics, financial and weather forecasts, censuses, medical studies, chaos, quantum physics, and climate, he makes one thing clear: a reasonable probability is the only certainty.

This book is a tribute to Professor Ian Hugh Sloan on the occasion of his 80th birthday. It consists of nearly 60 articles written by international leaders in a diverse range of areas in contemporary computational mathematics. These papers highlight the impact and many achievements of Professor Sloan in his distinguished academic career. The book also presents state of the art knowledge in many computational fields such as quasi-Monte Carlo and Monte Carlo methods for multivariate integration, multi-level methods, finite element methods, uncertainty quantification, spherical designs and integration on the sphere, approximation and interpolation of multivariate functions, oscillatory integrals, and in general in information-based complexity and tractability, as well as in a range of other topics. The book also tells the life story of the renowned mathematician, family man, colleague and friend, who has been an inspiration to many of us. The reader may especially enjoy the story from the perspective of his family, his wife, his daughter and son, as well as grandchildren, who share their views of Ian. The clear message of the book is that Ian H. Sloan has been a role model in science and life.

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.

### The Mathematics of Life Basic Books

This textbook provides a unified and concise exploration of undergraduate mathematics by approaching the subject through its history. Readers will discover the rich tapestry of ideas behind familiar topics from the undergraduate curriculum, such as calculus, algebra, topology, and more. Featuring historical episodes ranging from the Ancient Greeks to Fermat and Descartes, this volume offers a glimpse into the broader context in which these ideas developed, revealing unexpected connections that make this ideal for a senior capstone course. The presentation of previous versions has been refined by omitting the less mainstream topics and inserting new connecting material, allowing instructors to cover the book in a one-semester course. This condensed edition prioritizes succinctness and cohesiveness, and there is a greater emphasis on visual clarity, featuring full color images and high quality 3D models. As in previous editions, a wide array of mathematical topics are covered, from geometry to computation; however, biographical sketches have been omitted. *Mathematics and Its History: A Concise Edition* is an essential resource for courses or reading programs on the history of mathematics. Knowledge of basic calculus, algebra, geometry, topology, and set theory is assumed. From reviews of previous editions: “*Mathematics and Its History* is a

joy to read. The writing is clear, concise and inviting. The style is very different from a traditional text. I found myself picking it up to read at the expense of my usual late evening thriller or detective novel.... The author has done a wonderful job of tying together the dominant themes of undergraduate mathematics." Richard J. Wilders, MAA, on the Third Edition "The book...is presented in a lively style without unnecessary detail. It is very stimulating and will be appreciated not only by students. Much attention is paid to problems and to the development of mathematics before the end of the nineteenth century.... This book brings to the non-specialist interested in mathematics many interesting results. It can be recommended for seminars and will be enjoyed by the broad mathematical community." European Mathematical Society, on the Second Edition

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. “Witty, compelling, and just plain fun to read . . .” —Evelyn Lamb, *Scientific American*

The Freakonomics of math—a math-world superstar unveils the hidden beauty and logic of the world and puts its power in our hands The math we learn in school can seem like a dull set of rules, laid down by the ancients and not to be questioned. In *How Not to Be Wrong*, Jordan Ellenberg shows us how terribly limiting this view is: Math isn’t confined to abstract incidents that never occur in real life, but rather touches everything we do—the whole world is shot through with it. Math allows us to see the hidden structures underneath the messy and chaotic surface of our world. It’s a science of not being wrong, hammered out by centuries of hard work and argument. Armed with the tools of mathematics, we can see through to the true meaning of information we take for granted: How early should you get to the airport? What does “public opinion” really represent? Why do tall parents have shorter children? Who really won Florida in 2000? And how likely are you, really, to develop cancer? *How Not to Be Wrong* presents the surprising revelations behind all of these questions and many more, using the mathematician’s method of analyzing life and exposing the hard-won insights of the academic community to the layman—minus the jargon. Ellenberg chases mathematical threads through a vast range of time and space, from the everyday to the cosmic, encountering, among other things, baseball, Reaganomics, daring lottery schemes,

Voltaire, the replicability crisis in psychology, Italian Renaissance painting, artificial languages, the development of non-Euclidean geometry, the coming obesity apocalypse, Antonin Scalia's views on crime and punishment, the psychology of slime molds, what Facebook can and can't figure out about you, and the existence of God. Ellenberg pulls from history as well as from the latest theoretical developments to provide those not trained in math with the knowledge they need. Math, as Ellenberg says, is "an atomic-powered prosthesis that you attach to your common sense, vastly multiplying its reach and strength." With the tools of mathematics in hand, you can understand the world in a deeper, more meaningful way. *How Not to Be Wrong* will show you how.

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 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.

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.

"Few of us really appreciate the full power of math--the extent to which its influence is not only in every office and every home, but also in every courtroom and hospital ward. In this ... book, Kit Yates explores the true stories of life-changing events in which the application--or misapplication--of mathematics has played a critical role: patients crippled by faulty genes and entrepreneurs bankrupted by faulty algorithms; innocent victims of miscarriages of justice; and the unwitting victims of software glitches"--Publisher marketing.

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.

The seventeen equations that form the basis for life as we know it Most people are familiar with history's great equations: Newton's Law of Gravity, for instance, or Einstein's theory of relativity. But the way these mathematical breakthroughs have contributed to human progress is seldom appreciated. In *In Pursuit of the Unknown*, celebrated mathematician Ian Stewart untangles the roots of our most important mathematical statements to show that equations have long been a driving force behind nearly every aspect of our lives. Using seventeen of our most crucial equations--including the Wave Equation that allowed engineers to measure a building's response to earthquakes, saving countless lives, and the Black-Scholes model, used by bankers to track the price of financial derivatives over time--Stewart illustrates that many of the advances we now take for granted were made possible by mathematical discoveries. An approachable, lively, and informative guide to the mathematical building blocks of modern life, *In Pursuit of the Unknown* is a penetrating exploration of how we

have also used equations to make sense of, and in turn influence, our world. See the world in a completely new way as an esteemed mathematician shows how math powers the world—from technology to health care and beyond. Almost all of us have sat in a math class, wondering when we'd ever need to know how to find the roots of a polynomial or graph imaginary numbers. And in one sense, we were right: if we needed to, we'd use a computer. But as Ian Stewart argues in *What's the Use?*, math isn't just about boring computations. Rather, it offers us new and profound insights into our world, allowing us to accomplish feats as significant as space exploration and organ donation. From the trigonometry that keeps a satellite in orbit to the prime numbers used by the world's most advanced security systems to the imaginary numbers that enable augmented reality, math isn't just relevant to our lives. It is the very fabric of our existence.

"Will this book do for biomathematics what Stephen Hawking's *A Brief History of Time* did for relativity and cosmology? Time will tell. Until then, the distinguished author's friendly, well-argued style should guarantee its popular success." --Times Higher Education Supplement (London) 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.

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.

One of the world's great mathematicians shows why math is the ultimate timesaver—and

how everyone can make their lives easier with a few simple shortcuts. We are often told that hard work is the key to success. But success isn't about hard work – it's about shortcuts. Shortcuts allow us to solve one problem quickly so that we can tackle an even bigger one. They make us capable of doing great things. And according to Marcus du Sautoy, math is the very art of the shortcut. Thinking Better is a celebration of how math lets us do more with less. Du Sautoy explores how diagramming revolutionized therapy, why calculus is the greatest shortcut ever invented, whether you must really practice for ten thousand hours to become a concert violinist, and why shortcuts give us an advantage over even the most powerful AI. Throughout, we meet artists, scientists, and entrepreneurs who use mathematical shortcuts to change the world. Delightful, illuminating, and above all practical, Thinking Better is for anyone who has wondered why you should waste time climbing the mountain when you could go around it much faster.

Provides an in-depth analysis of the cognitive science of mathematical ideas that argues that conceptual metaphor plays a definitive role in mathematical ideas, exploring such concepts as arithmetic, algebra, sets, logic, and infinity. 20,000 first printing.

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

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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.

Calls for an end to religion's role in dictating morality, demonstrating how the scientific community's understandings about the human brain may enable the establishment of secular codes of behavior.

Going beyond our understanding of how the science of genetics predestines life as we know it, explores the relatively new concept of complex mathematical laws governing not only humankind's genetic makeup, but that of the whole natural world

School maths is not the interesting part. The real fun is elsewhere. Like a magpie, Ian Stewart has collected the most enlightening, entertaining and vexing 'curiosities' of maths over the years... Now, the private collection is displayed in his cabinet. There are some hidden gems of logic, geometry and probability -- like how to extract a cherry from a cocktail glass (harder than you think), a pop up dodecahedron, the real reason why you can't divide anything by zero and some tips for making money by proving the obvious. Scattered among these are keys to unlocking the mysteries of Fermat's last theorem, the Poincar Conjecture, chaos theory, and the P/NP problem for which a million dollar prize is on offer. There are beguiling secrets about familiar names like Pythagoras or prime numbers, as well as anecdotes about great mathematicians. Pull out the drawers of the Professor's cabinet and who knows what could happen...

A hugely enjoyable, brilliantly researched explanation of the basic principles of maths.

Welcome back to Ian Stewart's magical world of mathematics! This is a strange world of never-

ending chess games, empires on the moon, furious fireflies, and, of course, disputes over how best to cut a cake. Each quirky tale presents a fascinating mathematical puzzle — challenging, fun, and also introducing the reader to a significant mathematical problem in an engaging and witty way.

"From the shapes of clouds to dewdrops on a spider's web, this accessible book employs the mathematical concepts of symmetry to portray fascinating facets of the physical and biological world. More than 120 figures illustrate the interaction of symmetry with dynamics and the mathematical unity of nature's patterns"--

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