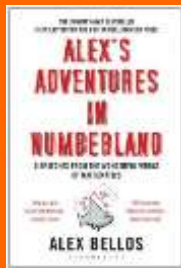


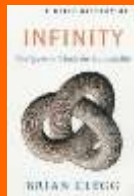
# Mathematics Extended Reading List

## Alex's Adventures in Numberland by Alex Bellos (510)



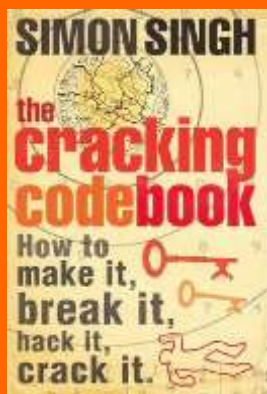
The world of maths can seem mind-boggling, irrelevant and, let's face it, boring. This ground-breaking book reclaims maths from the geeks. Mathematical ideas underpin just about everything in our lives: from the surprising geometry of the 50p piece to how probability can help you win in any casino. In search of weird and wonderful mathematical phenomena, Alex Bellos travels across the globe and meets the world's fastest mental calculators in Germany and a startlingly numerate chimpanzee in Japan. Packed with fascinating, eye-opening anecdotes, *Alex's Adventures in Numberland* is an exhilarating cocktail of history, reportage and mathematical proofs that will leave you awestruck.

## A Brief History of Infinity: the Quest to Think the Unthinkable by Brian Clegg (510)



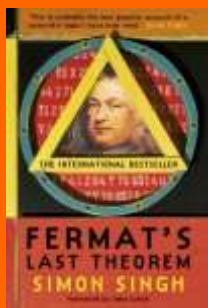
Brian Clegg takes us on a fascinating tour of that borderland between the extremely large and the ultimate that takes us from Archimedes, counting the grains of sand that would fill the universe, to the latest theories on the physical reality of the infinite. Full of unexpected delights, whether St Augustine contemplating the nature of creation, Newton and Leibniz battling over ownership of calculus, or Cantor struggling to publicise his vision of the transfinite, infinity's fascination is in the way it brings together the everyday and the extraordinary, prosaic daily life and the esoteric.

## Cracking Codebook by Simon Singh (652.8)



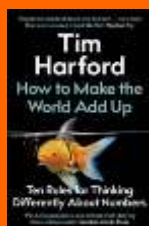
How to make it, break it, hack it, crack it. The secret history of codes and code breaking. Simon Singh's best-selling title *The Code Book* now re-issued for the young-adult market. The Science of Secrecy from Ancient Egypt to Quantum Cryptography. Simon Singh brings life to an amazing story of puzzles, codes, languages and riddles -- revealing the continual pursuit to disguise and uncover, and to work out the secret languages of others. Codes have influenced events throughout history, both in the stories of those who make them and those who break them. The betrayal of Mary Queen of Scots and the cracking of the enigma code that helped the Allies in World War II are major episodes in a continuing history of cryptography. In addition to stories of intrigue and warfare, Simon Singh also investigates other codes, the unravelling of genes and the rediscovery of ancient languages and most tantalisingly, the Beale ciphers, an unbroken code that could hold the key to a USD20 million treasure.

## Fermat's Last Theorem by Simon Singh (512.7)



'I have a truly marvellous demonstration of this proposition which this margin is too narrow to contain.' It was with these words, written in the 1630s, that Pierre de Fermat intrigued and infuriated the mathematics community. For over 350 years, proving Fermat's Last Theorem was the most notorious unsolved mathematical problem, a puzzle whose basics most children could grasp but whose solution eluded the greatest minds in the world. In 1993, after years of secret toil, Englishman Andrew Wiles announced to an astounded audience that he had cracked Fermat's Last Theorem. He had no idea of the nightmare that lay ahead. In 'Fermat's Last Theorem' Simon Singh has crafted a remarkable tale of intellectual endeavour spanning three centuries, and a moving testament to the obsession, sacrifice and extraordinary determination of Andrew Wiles: one man against all the odds.

## How to make the World Add Up by Tim Harford (519.5)



Statistics are vital in helping us tell stories - we see them in the papers, on social media, and we hear them used in everyday conversation - and yet we doubt them more than ever. But numbers - in the right hands - have the power to change the world for the better.

Contrary to popular belief, good statistics are not a trick, although they are a kind of magic.

Good statistics are not smoke and mirrors; in fact, they help us see more clearly.

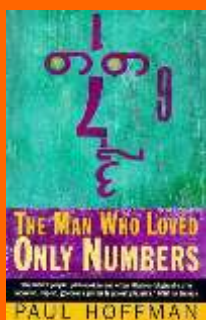
Good statistics are like a telescope for an astronomer, a microscope for a bacteriologist, or an X-ray for a radiologist.

## Letters to a Young Mathematician by Ian Stewart (510.92)



The first scientific entry in the acclaimed Art of Mentoring series from Basic Books, *Letters to a Young Mathematician* tells readers what Ian Stewart wishes he had known when he was a student and young faculty member. Subjects ranging from the philosophical to the practical--what mathematics is and why it's worth doing, the relationship between logic and proof, the role of beauty in mathematical thinking, the future of mathematics, how to deal with the peculiarities of the mathematical community, and many others--are dealt with in Stewart's much-admired style, which combines subtle, easy-going humour with a talent for cutting to the heart of the matter. In the tradition of G.H. Hardy's classic *A Mathematician's Apology*, this book is sure to be a perennial favourite with students at all levels, as well as with other readers who are curious about the frequently incomprehensible world of mathematics.

## The Man who Loved Only Numbers by Paul Hoffman (510.92)



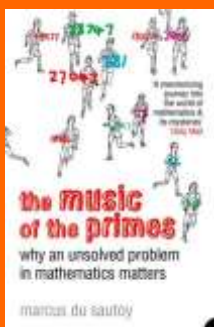
The biography of a mathematical genius. Paul Erdos was the most prolific pure mathematician in history and, arguably, the strangest too. 'A mathematical genius of the first order', Paul Erdos was totally obsessed with his subject - he thought and wrote mathematics for nineteen hours a day until he died. He travelled constantly, living out of a plastic bag and had no interest in food, sex, companionship, art - all that is usually indispensable to a human life. Paul Hoffman, in this marvellous biography, gives us a vivid and strangely moving portrait of this singular creature, one that brings out not only Erdos' genius and his oddness, but his warmth and sense of fun, the joyfulness of his strange life.' Oliver Sacks for six decades Erdos had no job, no hobbies, no wife, no home; he never learnt to cook, do laundry, drive a car and died a virgin. Instead he travelled the world with his mother in tow, arriving at the doorstep of esteemed mathematicians declaring 'My brain is open'. He travelled until his death at 83, racing across four continents to prove as many theorems as possible, fuelled by a diet of espresso and amphetamines.

## Mathematics by Timothy Gowers (510)



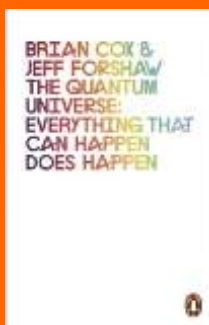
The aim of this book is to explain, carefully but not technically, the differences between advanced, research-level mathematics, and the sort of mathematics we learn at school. The most fundamental differences are philosophical, and readers of this book will emerge with a clearer understanding of paradoxical-sounding concepts such as infinity, curved space, and imaginary numbers. The first few chapters are about general aspects of mathematical thought. These are followed by discussions of more specific topics, and the book closes with a chapter answering common sociological questions about the mathematical community (such as "Is it true that mathematicians burn out at the age of 25?") It is the ideal introduction for anyone who wishes to deepen their understanding of mathematics.

## The Music of Primes by Marcus du Sautoy (512)



In 1859, German mathematician Bernhard Riemann presented a paper to the Berlin Academy that would forever change the history of mathematics. The subject was the mystery of prime numbers. At the heart of the presentation was an idea that Riemann had not yet proved but one that baffles mathematicians to this day. Solving the Riemann Hypothesis could change the way we do business, since prime numbers are the lynchpin for security in banking and e-commerce. It would also have a profound impact on the cutting-edge of science, affecting quantum mechanics, chaos theory, and the future of computing. Leaders in math and science are trying to crack the elusive code, and a prize of \$1 million has been offered to the winner. In this engaging book, Marcus du Sautoy reveals the extraordinary history behind the holy grail of mathematics and the ongoing quest to capture it.

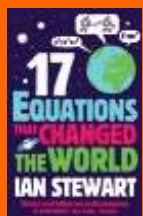
## The Quantum Universe by Brian Cox and Jeff Forshaw (539)



In *The Quantum Universe*, Brian Cox and Jeff Forshaw approach the world of quantum mechanics in the same way they did in *Why Does E=mc2?* and make fundamental scientific principles accessible and fascinating to everyone. The subatomic realm has a reputation for weirdness, spawning any number of profound misunderstandings, journeys into Eastern mysticism, and woolly pronouncements on the interconnectedness of all things. Cox and Forshaw's contention? There is no need for quantum mechanics to be viewed this way. There is a lot of mileage in the 'weirdness' of the quantum world, and it often leads to confusion and, frankly, bad science. *The Quantum Universe* cuts through the Wu Li and asks what observations of the natural world made it necessary, how it was constructed, and why we are confident that, for all its apparent strangeness, it is a good theory. The quantum mechanics of *The*

*Quantum Universe* provide a concrete model of nature that is comparable in its essence to Newton's laws of motion, Maxwell's theory of electricity and magnetism, and Einstein's theory of relativity.

### Seventeen Equations that Changed the World by Ian Stewart (512.94)



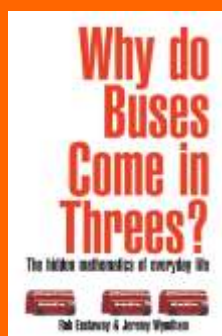
From Newton's Law of Gravity to the Black-Scholes model used by bankers to predict the markets, equations, are everywhere -- and they are fundamental to everyday life. *Seventeen Equations that Changed the World* examines seventeen ground-breaking equations that have altered the course of human history. He explores how Pythagoras's Theorem led to GPS and Satnav; how logarithms are applied in architecture; why imaginary numbers were important in the development of the digital camera, and what is really going on with Schroedinger's cat. Entertaining, surprising and vastly informative.

### Things to Make Do in the Fourth Dimension by Matt Parker (510.20)



This is the complete guide to exploring the fascinating world of maths you were never told about at school. Stand-up comedian and mathematician Matt Parker uses bizarre Klein Bottles, unimaginably small pizza slices, knots no one can untie and computers built from dominoes to reveal some of the most exotic and fascinating ideas in mathematics. Starting with simple numbers and algebra, this book goes on to deal with inconceivably big numbers in more dimensions than you ever knew existed. And always with something for you to make or do along the way.

### Why do buses come in threes by Rob Estaway (510)



Why is it better to buy a lottery ticket on a Thursday?

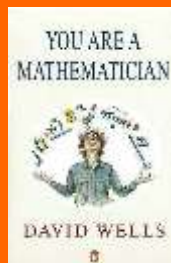
Why are showers always too hot or too cold? And what's the connection between Rob Andrew taking a conversion in rugby and a tourist trying to get the best photograph of Nelson's Column?

These and many other fascinating questions are answered in this entertaining and highly informative book ideal for anyone wanting to remind themselves - or discover for the first time - that maths is relevant to almost everything that we do.

As explained here, dating, cooking, travelling, gambling and even life-saving are all linked with intriguing mathematical problems.

Whether you have a PhD in astrophysics or haven't touched a maths problem since your school days, this book will give you a fresh understanding of the hidden maths in the world around you.

### You are a Mathematician by David Wells (510)



Anyone familiar with numbers, circles, straight lines and squares can become a mathematician. 'All you have to do,' claims David Wells, 'is to learn to look at these objects with some insight and imagination, maybe do a few experiments, and be able to draw reasonable conclusions...' This entertaining and informative introduction to mathematics begins with the secrets of triangles and the dazzling patterns formed by even the simplest numbers. It examines polyhedral cheeses, reverse Koch snowflakes and Rabbi Moses' box, takes readers on 'a journey from the Greek mathematicians to quantum theory' and concludes with a challenging adventure game.

