Mathematics and further mathematics suggested reading list

Flatland - Edwin Abbott

Can you imagine what it would be like to live in a flat (2-dimensional) world? How would you pass someone on the street? This Victorian classic certainly makes you think in a way you will never have thought before!

1089 and all that - David Acheson

A small book that explains some big ideas in a simple way. Definitely worth the short time it will take to read.

Super crunchers -Ian Ayres

How numbers can be used to predict the future …. this book looks at the recent explosion in the use of numerical data (rather than professional opinion) to shape planning for the future. Rather than relying on experts, the future may well rest on whether the "computer says no". Very readable and very interesting.

Think of a number - Johnny Ball

Once upon a time Zoë Ball's dad, Johnny, was the famous one. His TV show entertained and inspired me when I was at school and perhaps this book will do the same for you. Dip in and enjoy.

Strange Curves, Counting Rabbits and other Mathematic Explorations - Keith Ball

This book is full of lovely Mathematical ideas – some easy to understand, some rather harder. Dip into it and see what you find.

Mathematical Recreations and Essay -W W R Ball

First published in 1892, this book is full of wonderful mathematical ideas and situations. Read a page at random and see where it leads.

The infinite book- John D. Barrow

Infinity is one of my favourite subjects. Try this book to discover some of the amazing properties of this concept. Some infinities bigger than others? Why time travel can't be possible? Lots of jokes? This book combines history, science fiction, mathematics and pretty much everything in between. An interesting read for anyone.

Randomness - Deborah Bennett

What are the odds? What a coincidence!? The Law of Probability says …
If you want to know a little more about the chances of things happening and the likelihood of bizarre coincidences then read this book. Well written and full of interesting stories.

The Joy of π - David Blatner

All you ever wanted to know about π and more. This is a great book to dip in to, it even tells you the first million digits of π!

The tiger that isn't - Michael Blastland and Andrew Dilnot

This is a very intelligently written book about how to make sense of the wealth of numbers that surround us all the time but we probably don't think about carefully enough. What does Government spending of £300 million really mean? What is "average pay"? Should we believe school league tables? This book is very readable but also contains some very powerful arguments. Well worth the time spent on reading it.

An introduction to determinants and matrices - F Bowman

For the enthusiast (or Further Mathematician) only. This book introduces the powerful idea of matrices.

The Greeks - Mary Brading

Activities and stories relating to Ancient Greek Mathematics. This book is interesting and fun without being too hard! Try it and see.

How round is your circle? - John Bryant and Chris Sangwin

This book asks and answers some interesting questions. For example: How can you draw an exactly straight line? How do you tell if a circle is really round? How can you drill a square hole? The writers combine practical solutions with some intriguing mathematical techniques. Hard work in places but worth flicking through to see what might catch your imagination.

Conned again, Watson - Colin Bruce

Sherlock Holmes gets to the bottom of some puzzling Mathematical problems with Watson's help. Part story book, part guide to areas of Maths you might not have visited before, a good book for a rainy day.

The Fascination of Groups - F J Budden

The subject of groups is hugely important in Higher Mathematics with uses in unexpected areas from subatomic particles to the Rubik's Cube. This book covers a great deal of material in plenty of detail. If you are thinking of Maths at University then have a look at this book.

Elementary Calculus
G W Caunt

Calculus textbook with lots of questions (and even the answers!). May help with that tricky integral you were stuck on.

Infinitesimal Calculus
G W Caunt

See how calculus was taught around the time of the First World War. Includes a section on Virtual Work, now there's an idea!

A Basic Course in Statistics
G M Clarke & D Cooke

This book provides a good source of alternative explanations to A-Level standard statistical ideas.

The Egyptians
Channel 4

Activities and stories about the Ancient Egyptians.

Concise Dictionary of Mathematics
C Clapham

An excellent reference book if you are ever confused about the words used in Mathematics.

The Curves of Life
Theodore Cook

Ever wondered where Mathematics appears in Nature? This book has hundreds of examples illustrated by lots of pictures. It also looks at buildings, architecture and Art. A book to dip into rather than read cover to cover, probably.

Mathematical Models
Cundy & Rollett

Solving equations using water? Impossible you say, well try p 190. This classic book is full of ideas for models and patterns. It is hard work in places but see what you can do given a bit of effort!

Descartes' Dream
Philip Davis & Reuben Hersh

This book examines the effect of computers on the world around us. Full of interesting examples and deep ideas.

The Mathematical Experience
Philip Davis and Reuben Hersh

A classic. Full of examples and ideas showing how powerful Mathematics can be and where it is used.

Prime Obsession
John Derbyshire

Not another book on the Reimann Hypothesis I hear you say. Well, yes it is, but if you are going to be the one who claims the $1000000 prize for solving this greatest of modern Mathematical riddles you will need as much information as you can get. This book is detailed but readable, full of anecdotes as well as Mathematics.

Unknown Quantity
John Derbyshire

A wonderful book that combines history and Mathematics to tell the tale of algebra. The characters are never boring (one died in a duel aged 20, another was skinned alive by an angry mob) and although many complex ideas are visited, the author explains them clearly and simply. Try it and see what you think.

Mathematics & Measurement
O Dilke

A surprisingly interesting look at the history of measurement in the ancient world. Worth a dip.

The Mathematical Universe
William Dunham

An alphabetical tour through lots of areas of Mathematics, some quite complicated, some quite easy. Choose a chapter and see what you think!

How many socks make a pair?
Rob Eastaway

This is a very readable, well written book containing lots of interesting information. Want some Sudoku tips? How does the Dragon Curve come about by simply folding a piece of paper lots of times? Need some more card tricks? Just try a chapter and see what you learn.

Why do buses come in threes?
Rob Eastaway & Jeremy Wyndham

A great book on the Mathematics that is all around us. The writers aim to settle questions such as "What's the best bet?", "How do you explain a coincidence?" and "Why do buses come in threes?". Well written and very entertaining.

How to take a penalty
Rob Eastaway and John Haigh

More Mathematical curiosities from these excellent authors but this time the situations all involve sport. You can learn the best strategy when taking penalties and much, much more.

The Number Devil
Hans Magnus Enzensberger

Bizarre but rather wonderful, this book describes the dreams of a boy called Robert and his encounters with the Number Devil who shows him some lovely ways of thinking about numbers and how they behave. Try it and see if you like it!

Adventures with impossible figures
Bruno Ernst

If you have ever wondered how optical illusions work then this book will explain in a clear and exciting way. This is one of my favourite books. Try it!

The Magic Mirror of M. C. Escher - Bruno Ernst

I love this book. It is full of pictures by Escher but also shows how he came up with the ideas behind them. If you like Art or optical illusions then this is the book for you.

The History of Mathematics – A Reader - Fauvel & Gray

Plato, Euclid, Fermat, Newton, Galois, Möbius etc….. This book contains their writings in their own (translated) words. Fascinating.

Higher Algebra - W L Ferrar

A classic algebra textbook tackling topics from 'A'-Level and beyond.

Surely you're joking Mr Feynman - Richard Feynman

Not, strictly speaking, a Mathematician but such an interesting character that I recommend this book unreservedly. Feynman combined a life in Physics, culminating in a Nobel Prize, with being a great practical joker, safe cracker, bongo player and storyteller. A great autobiography.

What do you care what other people think?
Richard Feynman

More adventures of Richard Feynman, Nobel Prize winning Physicist. Some great stories. Read this after you have read "Surely you're joking Mr Feynman".

In Code
Sarah Flannery

A school girl? Cracking 'unbreakable' codes? Designing methods that computer companies around the world want to buy? This book tells the story of Sarah Flannery in her own words. Very readable, always interesting. Perhaps you will try to follow in Sarah's footsteps??

Mathematical puzzling
Tony Gardiner

This book is full of unusual but challenging puzzles for those spare moments in the day when you want something interesting to do. Dip into this book and I am sure you will get hooked.

Colossal book of short puzzles and problems
Martin Gardner

Martin Gardner practically created the modern idea of recreational Mathematics. Through his games and puzzles he has inspired countless people to pursue Mathematics further and deeper. You will find a huge number of interesting, challenging and fruitful puzzles in this book. Try a few and you may well be hooked too!

Mathematical Puzzles and Diversions from Scientific American
Martin Gardner

Want to know about Hexaflexagons or 3D noughts and crosses? The Tower of Hanoi or Sam Loyds classic puzzles? This book will explain lots of interesting ideas and puzzles in a very understandable way. Gardner is an exceptional guide. Do not be put off by the fact that the cover looks old. An excellent book.

Fascinating Fibonaccis
T H Garland

1,1,2,3,5,8,……….adding the previous two numbers to get the next one gives the Fibonacci sequence. This lovely book explains the origins and occurrences of this sequence all around us. Well-explained and clear, this book is entertaining and intriguing.

Mathematics – A Very Short Intro
Tim Gowers

This is a deceptively small and simple book. Tim Gowers is one of the foremost Mathematicians of the age – and is British. He explains what Mathematics is in simple terms but manages to include some very profound ideas at the same time. An exceptionally good book.

The Princeton Companion to Mathematics
Tim Gowers (Editor)

This magnificent book is a wonderful work of reference for Mathematics. If you want to know about Mathematicians through history, if you want to discover the starting points for academic research, if you want to read about the background, philosophy and aims of Mathematics, you can. It is all in here, and more!
Do not be put off by the technical terms, the text is readable and is full of Mathematical gems. Try it and see!

Taking Chances – Winning without Probability
John Haigh

If you really want to know what is going on when you play games of chance then this is an excellent place to start. Thorough but entertaining, this book sets out to explain the role of probability in winning.

Solid Geometry
J S Haib & E J Hopkins

A textbook for the "good old days" of A-Level geometry.

A Mathematician's Apology
G H Hardy

An absolute classic from one of Britain's greatest Mathematicians. His musings on Mathematics between the World Wars are worth reading purely from a historical perspective. However, they are also intriguing if you have any hint of being a Mathematician yourself.

Impossible?
Julian Havil

Another inspirational book from Dr Havil who teaches "down the hill". There are lots of snippets of intriguing, unexpected mathematical results in this book. The level of knowledge needed in places is high but there are enough comments, jokes and pieces of history to suggest that learning the Mathematics to be able to read the details would be time well spent.

Nonplussed!
Julian Havil

Not for the faint-hearted, this is a thought provoking book that uses Mathematics, some of it hard, to investigate some interesting situations. Hard work on this book will be rewarded with some impressive insights.

Mathematics for the curious
Peter M. Higgins

Ever wondered when the hands on a clock coincide? This book presents lots of interesting and enlightening problems in an accessible way. As the title says, if you are intrigued by Maths this could be the book for you.

The Man who loved only numbers
Paul Hoffman

A wonderful book about one of Mathematics' true eccentrics. Well told and always entertaining, this is an excellent read.

Gödel, Escher and Bach: An Eternal Golden Braid
Douglas Hofstadter

If you can understand this book, come and explain it to me!

How to lie without Statistics
Darrell Huff

A lovely little book that explains how statistics should only be trusted if fully understood. In the hands of a crook you might be made to believe almost anything!

The Divine Proportion
H E Huntley

A lovely little book full of the beauty and simplicity of Mathematics. If the Da Vinci Code has inspired you to find out more about phi then this book will help.

The Universal History of Numbers
Georges Ifrah

If you want to see how many different systems and symbols have been used to count then this is the book for you. Hugely detailed so perhaps best dipped into when you want information.

Remarkable Mathematicians
Ioan Jones

An excellent book giving brief biographies of 50 of the most important Mathematicians in history. Each story is short enough to make a quick read. The book as a whole gives a fascinating insight into the diversity of characters who have contributed to the subject over the years.

The man who knew infinity
Robert Kanigel

Ramanujan's story is one of genius in a raw untutored form. G.H. Hardy recognised the potential in the letter he received from India and brought Ramanujan to Cambridge to join him in discovering powerful new Mathematical gems. Tragic ending but an absolutely amazing tale.

Amazing Origami
Kunihiko Kashara

Beautiful models made by just folding squares of paper. This book encourages you to make some truly stunning models but also to think about the Mathematics involved. Excellent.

A History of Mathematics
Victor Katz

This is a good book for reference and the occasional bizarre story. The text does go into detail so possibly not suitable for a light read!

The Pleasures of Counting
T. W. Korner

For the real enthusiast only! This book has lots of interesting tales of Mathematics and its uses but goes into considerable detail. If you are willing to persevere, you may unearth some real gems.

Vectors
E H Leaton

A textbook on vectors from their simplest form to Further Maths level. Possibly good for reference.

A concise introduction to Pure Mathematics
Martin Liebeck

If you are considering studying Mathematics at University then this book will give you a flavour of the sort of things you will meet. Although at first sight the material us rather dry and abstract, if you persevere you will learn some powerful ideas and enjoy the process too!

Statistics – A first course
Robert Loveday

An old-fashioned statistics text book covering GCSE and some A-Level material.

Number
John McLeish

This book works its way through an impressive number of periods in history showing the way Mathematics has evolved and grown. Not the easiest of reads but worth the effort.

Elementary Vector Algebra
A M Macbeath

A textbook on vectors. Well explained with clear diagrams – this book may help you if you are stuck on vectors at A-Level.

The fractal Geometry of Nature
B B Mandelbrot

A complex book full of rather wonderful illustrations. Mandelbrot was one of the founders of the study of fractal geometry.
Video games today owe a great debt to this man!

The Story of Mathematics
Richard Mankiewicz

An excellent book on the history of Mathematics. Full of interesting pictures and readable text. Good for reference.

e: the story of a number
Eli Maor

Lots of interesting things rely on the number *e*, the interest on a savings account, the seeds in a sunflower and even the Gateway Arch in St Louis. This book is quite hard work but it does explain the story of this essential number in detail. If you want to know about *e*, this is the book for you.

Bourbaki: A secret society of Mathematicians
Maurice Mashaal

This is a very special book – it isn't often that a Maths book will contain tales of a secretive group of Mathematicians who fooled the Mathematical world but whose intentions were wholly honourable. This book is an incredibly rich mixture of history, Mathematics and interesting stories. I dare you to read it!

Fallacies in Mathematics
E. A. Maxwell

This is a book a Sixth Form Mathematician might appreciate. It examines lots of examples of false thinking that produce plausible but wrong conclusions. For example, there is a "proof" that 4 = 0 and a "proof" that all triangles are isosceles. Not the easiest of reads but some real gems are hidden away in this book.

A Beautiful Mind
Sylvia Nasar

This is an excellent book – more satisfying and more realistic than the film starring Russell Crowe. Find out about the amazing life of John Forbes Nash, a Mathematician, Nobel Prize winning economist and schizophrenic.
NB In biography section of Library.

The Poincare Conjecture
Donal O'Shea

The Poincare conjecture is a century-old problem posed by one of the most important Mathematicians of the 19th century. It concerns the possible shape of the universe and had been unsolved until relatively recently. Would the solver claim the million dollar prize on offer? Would he accept a Fields Medal – the Mathematical equivalent of a Nobel prize? Read on and find out.

Mathematic Scandals
Theoni Pappas

Great stories told in an exciting way. This book hardly contains any numbers but is full of the interesting (and sometimes obsessive) people behind Mathematics. This is a <u>fun</u> book to read.

The adventures of Penrose the mathematical cat
Theoni Pappas

Penrose the cat leads you through a whole range of Mathematical activities … from tangrams to infinity. Worth a look if you are bored and want an entertaining challenge.

Triangles, Pyramids & Cones
Peter Patilla

This book does what it says in the title. Pretty pictures and simple ideas.

Beyond Numeracy
John Allen Paulos

This book contains a huge number of interesting topics in Mathematics explained clearly but also with great humour. It would be a great starting point and will hopefully spur you on to explore more deeply many of the ideas illustrated.

Numbers
Richard Phillips

This book looks at the properties of the numbers from 0 to 200 in detail and some others too. Full of lots of nice pictures and interesting facts.

A passion for Mathematics
Clifford A Pickover

This book is an amazing hotchpotch of quotations, puzzles, definitions, facts and puzzles. Open it at any page and I am sure you will find something interesting or a puzzle that you will want to have a go at.

How to solve it
G Polya

An absolute classic. This book looks at how to go about solving problems, giving practical suggestions, hints and methods. Read this if you are serious about solving.

Murderous Maths
Kjartan Poskitt

This is a funny but intelligent book introducing many Mathematical ideas in a way that anyone could understand. Try it.

Murderous Maths
Kjartan Poskitt

More of the same. If you've read Murderous Maths then you will definitely want to read this entertaining look at some interesting bits of Mathematics.

Use and abuse of statistics
W J Reichman

Do you trust statistics? You shouldn't unless you trust the person writing them. This book discusses the many ways in which statistics can be twisted to suit the person quoting them.

Women in the History of Mathematics
Patricia Rothman

I hope this book makes you angry. The fact that it is so thin and feeble-looking should cause you to explore in more depth the contribution of women to Mathematics and hopefully prompt you to make your own mark one day.

Statistics without Tears
Derek Rowntree

A clear guide to Statistics up to A-Level standard. This book aims to give a good all round explanation of what statistics are and how they work in practice.

The Fourth Dimension
Rudy Rucker

A very interesting book on the existence or otherwise of the Fourth Dimension. Full of bizarre ideas and explained with great humour, this book is certainly worth a look.

Chance & Chaos
David Ruelle

An interesting book which ponders the question of randomness and chance in the world around us. Some powerful ideas are explained with surprising ease. Well worth a look.

Dr Riemann's Zeros
K Sabbagh

An excellent book about Mathematics, Mathematicians and one mathematical problem in particular – Riemann's Hypothesis. Win $1,000,000 if you come up with the solution to this one!

Understanding Pure Mathematics
Sadler & Thorning

An old A-Level textbook that you might find helpful if you want more explanation on a topic you are finding tricky or for extra practice.

The Music of the Primes
Marcus du Sautoy

An enjoyable discussion of the history and current standing of Riemann's Hypothesis - one of the great unsolved mathematical problems of our age.

Finding moonshine
Marcus du Sautoy

This book tries to do two things. Firstly it wants to show you what being a professional Mathematician is like and it is surprisingly honest about the insecurity involved (for example, du Sautoy does not like to work where others might watch and see him struggling!). Secondly, it is a book about symmetry and its central role in Mathematics. The style is readable, it includes some interesting illustrations and all in all is a good, informative read.

Pure Mathematics
Sherlock, Roebuck, Heneage & Beck

If you want a different explanation to an A-Level topic, this might be the book for you.

Zero: The biography of a dangerous idea - Charles Siefe

A book about nothing? Not really because the concept of a number that represents the absence of quantity is one of the most powerful ever invented. Read about the history and evolution of this idea.

Fermat's Last Theorem - Simon Singh

A wonderful book which tells the tale of one of the biggest stories in Maths in recent years. A British triumph over a problem unsolved for over three hundred years. Entertainingly told without too much maths, this is an excellent read.

The Code Book - Simon Singh

This is an excellent book on the use of codes throughout history. The stories are fascinating and do not require too much maths. Read this for fun and learn something at the same time.

How Puzzling - Charles Snape

Lots of puzzles and problems from across history with a mathematical flavour. A fun way to pass half an hour.

Letters to a young Mathematician - Ian Stewart

This book aims to give you an insight into being a Mathematician, whether at school, University or as an academic career. The information given is useful but the real reason to read this book is to find out more about the strange tribe of people engaged in teaching and learning Mathematics.

From here to infinity - Ian Stewart

A readable and entertaining selection of modern Mathematical ideas. Flick through and see if anything grabs you!

Does God play dice? - Ian Stewart

More mathematical ideas examined by this prolific writer on current developments in Maths.

Flatterland - Ian Stewart

In the same vein as Edwin Abbott's classic Victorian book, this modern day exploration of space and geometry should entertain and intrigue you. Give it a try!

Game Set and Math - Ian Stewart

More modern Mathematical concepts for you to mull over. Try a chapter and see what you think!

Math Hysteria - Ian Stewart

A collection of games and puzzles that illustrate a wide range of Mathematical ideas. You may not even realise you are learning Maths if you get caught up in one!

Nature's Numbers - Ian Stewart

Patterns in nature provide a set of thought provoking and intriguing ideas for you to think about. Try it and see if you are hooked!

Mathematics with love - Mary Stopes-Roe

This book contains love letters between Barnes Wallis, the inventor of the Bouncing Bomb, and the young woman of his dreams, Molly Bloxham. Some of the letters aim to help Molly with her Mathematical studies, others tell us about courtship in the 1920s. A surprisingly different type of Maths book!

A Concise History of Mathematics - D J Struik

My mum won this book as a school prize many years ago and I've still got her copy. This is a classic on the history of Mathematics and the people behind it. Some great sections.

Essential Mathematics for A-Level - Taylor & Atkinson

Try this if you want another explanation of an A-Level topic or some extra practice questions.

The Pea and the Sun - Leonard M. Wapner

This book is rather hard work but if you are prepared to put in the effort you will be rewarded with an understanding of one of the most bizarre areas of Maths yet discovered and you will know how to cut up a pea and reassemble it into something the size of the sun!

Guesstimation - Lawrence Weinstein and John A. Adam
This is a wonderful little book based on the idea that we can estimate the answers to lots of questions based on very little actual information but lots of cunning thinking. For example: What is the total volume of human blood in the world? How long is all the DNA in your body? What is the radius of the Sun? How many golf balls would it take to circle the Earth at the equator? Dip in and enjoy!

Dictionary of curious and interesting numbers - D Wells

I love this book. Choose almost any number and you will find fascinating facts about it in here. Dip into this book and become addicted to it!

Prime Numbers - David Wells

This book contains more about prime numbers (numbers with exactly two factors) than you might ever need to know. Dip in and see what you find.

Symmetry - Hermann Weyl

This is an old book (first published in 1952) that is by no means out of date. Weyl explores examples of symmetry from many areas of the world around us – for example in repeating patterns,

shapes of flowers, buildings and crystal structures. A master of the subject goes from simple starting points to some quite complex results. Worth the effort.

The Infinite in the Finite - A M Wilson

This book contains extensive information on Mathematics from around the world over the history of civilisation. Hard work but full of detailed explanations on a large number of topics.

Lewis Carroll in Numberland - Robin Wilson

If you ever wondered about the background of Lewis Carroll, this book will fill in all the details for you – and more! Carroll's real name was Charles Lutwidge Dodgson and he was a Mathematics Lecturer at Oxford University. This book contains a description of his life, his writing for children and the Mathematics he studied. A lovely book.

Modern Mechanics – a vectorial approach - C A L Wragg

I'm not sure how you would do mechanics without vectors but having said that, this book tackles many mechanics topics clearly with plenty of worked examples.