KS3 Mathematics – Recommended Reading

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| **History of Mathematics** |
| Book Title | Author |
| The Boy Who Loved Math: The Improbable Life of Paul Erdős  | Deborah Heiligman |
| Blockhead: The Life of Fibonacci | Joseph D'Agnese |
| Infinity and Me | Kate Hosford |
| On a Beam of Light: A Story of Albert Einstein | Jennifer Berne |
| 50 Mathematical Ideas You Really Need to Know | Tony Crilly |
| The Math Book | Clifford A Pickover |
| Alex’s Adventures in Numberland | Alex Bellos |
| The Monty Hall Problem: Beyond Closed Doors | Rob Deaves |
| **Recreational Reading** |
| Book Title | Author |
| Can you Solve my Problems? | Alex Bellos |
| Snowflake Seashell Star | Alex Bellos & Edmund Harriss |
| A Mathematical Pandora’s Box | Brian Bolt |
| The Number Devil | Hans Magnus Enzensberger |
| The Indisputable Existence of Santa Claus | Hannah Fry & Thomas Oléron Evans |
| Aha! Insight & aha! Gotch | Martin Gardner |
| Entertaining Mathematical Puzzles | Martin Gardner |
| My Best Mathematical and Logic Puzzles | Martin Gardner |
| The Thrilling Adventures of Lovelace and Babbage | Sydney Padua |
| The ‘Uncle Albert’ Series | Russell Stannard |
| Professor Stewart’s Cabinet of Mathematical Curiosities | Ian Stewart |
| Book of Curious & Interesting Mathematics | David Wells |
| Book of Curious & Interesting Puzzles | David Wells |
| Mathematics, Magic and Mystery | Martin Gardner |
| How Many Socks Make a Pair? | Rob Eastaway |
| Why do Buses Come in Threes? | Rob Eastaway & Jeremy Wyndham |
| Flatterland | Ian Stewart |
| **Thinking Mathematically** |
| Book Title | Author |
| Elastic Numbers | Daniel Griller |
| Thinking Mathematically | Mason, Burton & Stacey |
| Finding Moonshine: A Mathematician’s Journey Through Symmetry | Marcus Du Sautoy |
| Mathematics for the Curious | Peter Higgins |
| Mathematics for the Imagination | Peter Higgins |
| Mathematics and the Physical World | Morris Kline |

KS4 Mathematics – Recommended Reading

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| **History of Mathematics** |
| Book Title | Author |
| The Monty Hall Problem: Beyond Closed Doors | Rob Deaves |
| The Language of Mathematics | Keith Devlin |
| The Music of the Primes | Marcus Du Sautoy |
| Journey Through Genius: The Great Theorems of Mathematics | William Dunham |
| The Mathematical Universe: Alphabetical Journey Through the Great Proofs, Problems & Personalities | William Dunham |
| Chaos | James Gleick |
| Euclid's Window: The Story of Geometry from Parallel Lines to Hyperspace | Leonard Mlodinow |
| Closing the Gap: The Quest to Understand Prime Numbers | Vicky Neale |
| Fermat's Last Theorem | Simon Singh |
| The Code Book | Simon Singh |
| The Penguin Dictionary of Curious and Interesting Numbers | David Wells |
| **Recreational Reading** |
| Book Title | Author |
| The Liar Paradox and the Towers of Hanoi: 10 Greatest Math Puzzles of All Time | Marcel Danesi |
| The Number Mysteries | Marcus du Sautoy |
| Things to Make and Do in the Fourth Dimension | Matt Parker |
| How to Cut a Cake: and Other Mathematical Conundrums | Ian Stewart |
| Games and Mathematics | David Wells |
| **Thinking Mathematically** |
| Book Title | Author |
| Mathematics: A Very Short Introduction | Timothy Gowers |
| Excursions in Geometry | C. Stanley Ogilvy |
| Excursions in Mathematics | C. Stanley Ogilvy |
| Excursions in Number Theory | C. Stanley Ogilvy & John Anderson |
| Q.E.D. – Beauty in Mathematical Proof | Burkard Polster |
| How to Solve It | George Polya |
| The Joy of X: A Guided Tour of Mathematics from One to Infinity | Steven Strogatz |
| Problem-Solving Strategies In Mathematics: From Common Approaches To Exemplary Strategies | Alfred S Posamentier & Stephen Krulik |
| 1089 and All That: A Journey into Mathematics | David Acheson |
| An Introduction to Mathematical Reasoning | Peter Eccles |



KS5 Mathematics – Recommended Reading

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| **Academic Text** |  |
| Book Title | Author | Description |
| Gödel, Escher, Bach: An Eternal Golden Braid | Douglas Hofstadter | Douglas Hofstadter's book is concerned directly with the nature of maps or links between formal systems. However, according to Hofstadter, the formal system that underlies all mental activity transcends the system that supports it. If life can grow out of the formal chemical substrate of the cell, if consciousness can emerge out of a formal system of firing neurons, then so too will computers attain human intelligence. Gödel, Escher, Bach is a wonderful exploration of fascinating ideas at the heart of cognitive science: meaning, reduction, recursion, and much more. |
| The Great Mathematical Problems | Ian Stewart | 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. This book 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 problems 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 |
| **Recreational Reading** |  |
| Book Title | Author | Description |
| Mathematical Puzzles: A Connoisseur’s Collection | Peter Winkler | Collected over several years by Peter Winkler, dozens of elegant, intriguing challenges are presented in this book. The answers are easy to explain, but without this book, devilishly hard to find. Creative reasoning is the key to these puzzles. No involved computation or higher mathematics is necessary, but your ability to construct a mathematical proof will be severly tested - even if you are a professional mathematician. For the truly adventurous, there is even a chapter on unsolved puzzles. |
| **Thinking Mathematically** |  |
| Book Title | Author | Description |
| What is Mathematics? | Richard Courant, Herbert Robbins & Ian Stewart | Written for beginners and scholars, for students and teachers, for philosophers and engineers, this book is a sparkling collection of mathematical gems that offers an entertaining and accessible portrait of the mathematical world. Covering everything from natural numbers and the number system to geometrical constructions and projective geometry, this fascinating survey allows readers to delve into mathematics as an organic whole rather than an empty drill in problem solving. With chapters largely independent of one another and sections that lead upward from basic to more advanced discussions, readers can easily pick and choose areas of particular interest without impairing their understanding of subsequent parts. |
| Towards Higher Mathematics: A Companion | Richard Earl | Containing a large and varied set of problems, this rich resource will allow students to stretch their mathematical abilities beyond the school syllabus, and bridge the gap to university-level mathematics. Many proofs are provided to better equip students for the transition to university. The author covers substantial extension material using the language of sixth-form mathematics, thus enabling students to understand the more complex material. There are over 1500 carefully graded exercises, with hints included in the text, and solutions available online. Historical and contextual asides highlight each area of mathematics and show how it has developed over time |
| The Art of the Infinite | Robert & Ellen Kaplan | This book unlocks the secrets of maths - revealing it to be our lost, native language, as much a part of us as the words we use every day. Number and form are the essence of our world: from the patterns of the stars to the pulses of the market, from the beats of our hearts to catching a ball or tying our shoelaces. Drawing on science, literature, history and philosophy, this book makes the rich patterns of maths brilliantly clear. |
| Algorithmic Puzzles | Anany & Maria Levitin | In this book, Anany and Maria Levitin use many classic brainteasers as well as newer examples from job interviews with major corporations to show readers how to apply analytical thinking to solve puzzles requiring well-defined procedures. The book's unique collection of puzzles is supplemented with carefully developed tutorials on algorithm design strategies and analysis techniques intended to walk the reader step-by-step through the various approaches to algorithmic problem solving. Mastery of these strategies - exhaustive search, backtracking, and divide-and-conquer, among others - will aid the reader in solving not only the puzzles contained in this book, but also others encountered in interviews, puzzle collections, and throughout everyday life. Each of the 150 puzzles contains hints and solutions, along with commentary on the puzzle's origins and solution methods. Readers with only middle school mathematics will develop their algorithmic problem-solving skills through puzzles at the elementary level, while seasoned puzzle solvers will enjoy the challenge of thinking through more difficult puzzles. |
| The Mathematics of Games and Gambling | Edward Packel | This book introduces and develops some of the important and beautiful elementary mathematics needed for rational analysis of various gambling and game activities. Most of the standard casino games (roulette, craps, blackjack, keno), some social games (backgammon, poker, bridge) and various other activities (state lotteries, horse racing) are treated in ways that bring out their mathematical aspects. The mathematics developed ranges from the predictable concepts of probability, expectation, and binomial coefficients to some less well-known ideas of elementary game theory. Game-related exercises are included and solutions to some appear at the end of the book |
| How to Study for a Mathematics Degree | Lara Alcock | Every year, thousands of students go to university to study mathematics. Many of these students are extremely intelligent and hardworking, but even the best will, at some point, struggle with the demands of making the transition to advanced mathematics. The mathematics shifts in focus from calculation to proof, so students are expected to interact with it in different ways. These changes need not be mysterious - mathematics education research has revealed many insights into the adjustments that are necessary - but they are not obvious and they do need explaining. This book translates these research-based insights into practical advice for a student audience. It covers every aspect of studying for a mathematics degree, from the most abstract intellectual challenges to the everyday business of interacting with lecturers and making good use of study time |
| How to Think Like a Mathematician | Kevin Houston | Looking for a head start in your undergraduate degree in mathematics? This friendly companion will ease your transition to real mathematical thinking. Working through the book you will develop an arsenal of techniques to help you unlock the meaning of definitions, theorems and proofs, solve problems, and write mathematics effectively. All the major methods of proof - direct method, cases, induction, contradiction and contrapositive - are featured. Concrete examples are used throughout, and you'll get plenty of practice on topics common to many courses such as divisors, Euclidean algorithms, modular arithmetic, equivalence relations, and injectivity and surjectivity of functions. With over 300 exercises to help you test your progress, you'll soon learn how to think like a mathematician. |