

# Preparing for Maths A-Level

## Where to begin?

In the next table you will find a list of topics that you have studied for your GCSEs that you need to be confident in for A Level Maths. The most essential topics are in bold, we recommend you start there and make you are 100% happy with them before moving on to practice other work.



## What can I listen to?

- How does the use of statistics help the reader make sense of the real-world issues being discussed? If you're interested in analysing the use of statistics (for good or ill!) try the 'More or Less' podcast by the BBC's Tim Harford.
- Marcus du Sautoy's 'A Brief History of Mathematics' on Radio 4 was excellent: informative and engaging. You can access all ten episodes on BBC iPlayer radio or as a podcast. If you're interested in mathematicians of the past there's also an excellent archive here (<http://www-history.mcs.st-and.ac.uk/>)

## What can I watch?

- The Numberphile videos are excellent (<http://www.numberphile.com/>): tricky mathematical concepts explained in an engaging and accessible way.
- The Royal Institution has an excellent YouTube channel (<https://www.youtube.com/user/TheRoyalInstitution> - scroll down to the maths playlist, under 'Browse talks by subject' – interesting lectures about all sorts of topics (and a useful insight into university-style learning too).
- How is Maths our real sixth sense? [https://www.ted.com/talks/eddie\\_woo\\_how\\_math\\_is\\_our\\_real\\_sixth\\_sense?language=en](https://www.ted.com/talks/eddie_woo_how_math_is_our_real_sixth_sense?language=en) ....
- and for the film buffs, here are 13 maths movies based on true events that will make you think about maths and mathematicians in a different way. <https://medium.com/@Alikayaspur/13-must-see-mathematics-movies-inspired-by-true-events-1beda86255cd>

## What books can I read?

### Best overall is:

CGP Head start to AS Maths (ISBN – 1841469939) (£4.95 on Amazon as of July 2017)

### Wider reading:

- I would highly recommend a book called '1089 and All That: A Journey Into Mathematics' by David Acheson. It's short, easy to read and introduces several fundamental A level concepts in a really engaging way. Available on Amazon.
- <https://freakonomics.com/archive/> The co-creation by an economist and a journalist. Freakonomics is an engaging and interesting book about a real mixture of topics and answers questions such as: what do teachers and sumo wrestlers have in common? Did tv cause a rise in crime? Can eating kangaroos save the planet? If you think statistics is boring, this book may convince you otherwise.

## What websites can I use?

<http://www.mathscareers.org.uk/> plenty of information about the value of maths in all sorts of jobs.  
<http://www.m4ths.com/gcse-to-a-level-bridge.html> videos of skills, essential during AS level maths.  
<http://www.resourceaholic.com/2014/10/bridging-gap-to-level.html> This site has some useful links to other bridging tasks and details of how your GCSE grade can impact your A level expected grade.  
<http://www.mymaths.co.uk> Full of useful topics that will be covered at AS level.  
<https://www.youtube.com/user/ExamSolutions> There are some really good Youtubers out there that you can follow. This is one of the best channels I've seen, keep in mind that his focus is Edexcel.

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Topic	Mathswatch clip number and worksheet	Worksheets and answers
<b>Surds</b>	207a – Introduction to Surds 207b - Surd Expressions 207c – Surds – Rationalizing the denominator	Adding and subtracting: <a href="https://corbettmaths.com/wp-content/uploads/2019/10/Surds.pdf">https://corbettmaths.com/wp-content/uploads/2019/10/Surds.pdf</a> Answers: <a href="https://corbettmaths.com/wp-content/uploads/2019/10/Surds-Answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/10/Surds-Answers.pdf</a> Rationalizing: <a href="https://corbettmaths.com/wp-content/uploads/2019/10/Rationalising-Denominators-pdf.pdf">https://corbettmaths.com/wp-content/uploads/2019/10/Rationalising-Denominators-pdf.pdf</a> Answers: <a href="https://corbettmaths.com/wp-content/uploads/2019/10/Rationalising-Answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/10/Rationalising-Answers.pdf</a>
<b>Indices</b>	82 – Working with Indices 154 – Negative Indices 188 – Fractional Indices	Laws of indices: <a href="https://corbettmaths.com/wp-content/uploads/2019/10/Indices.pdf">https://corbettmaths.com/wp-content/uploads/2019/10/Indices.pdf</a> Answers: <a href="https://corbettmaths.com/wp-content/uploads/2019/10/Laws-of-Indices.pdf">https://corbettmaths.com/wp-content/uploads/2019/10/Laws-of-Indices.pdf</a> Fractional and Negative Indices: <a href="https://corbettmaths.com/wp-content/uploads/2019/11/Indices-Fractional-Negative-pdf.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Indices-Fractional-Negative-pdf.pdf</a> Answers: <a href="https://corbettmaths.com/wp-content/uploads/2019/11/Negative-Fractional-Answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Negative-Fractional-Answers.pdf</a> Equations involving Indices/Roots: <a href="https://corbettmaths.com/wp-content/uploads/2019/11/Equations-indices-roots-1.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Equations-indices-roots-1.pdf</a> Answers: <a href="https://corbettmaths.com/wp-content/uploads/2019/11/Equations-Indices-Roots-Answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Equations-Indices-Roots-Answers.pdf</a>
<b>Graphing</b>	98 – Drawing Quadratic Graphs 143 – Distance-Time Graphs 150c – Pythagoras' Theorem – Line on a Graph	Exponential Graphs: <a href="https://corbettmaths.com/wp-content/uploads/2019/11/Exponential-Graphs.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Exponential-Graphs.pdf</a>

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	<p>161 – Cubic and Reciprocal Graphs</p> <p>216a – Velocity-Time graphs</p> <p>216b – Rate of Change</p>	<p>Answers:</p> <p><a href="https://corbettmaths.com/wp-content/uploads/2019/11/Exponential-Answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Exponential-Answers.pdf</a></p>
<b>Factorising</b>	<p>94 – Simple Factorisation</p> <p>157 – Factorising and Solving Quadratics</p> <p>192 – Factorising Hard Quadratics</p>	<p>Factorising:</p> <p><a href="https://corbettmaths.com/wp-content/uploads/2019/07/Factorising-pdf.pdf">https://corbettmaths.com/wp-content/uploads/2019/07/Factorising-pdf.pdf</a></p> <p>Answers:</p> <p><a href="https://corbettmaths.com/wp-content/uploads/2019/10/Factorising-Answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/10/Factorising-Answers.pdf</a></p> <p>Factorising Quadratics:</p> <p><a href="https://corbettmaths.com/wp-content/uploads/2019/10/Factorising-Quadratics-pdf.pdf">https://corbettmaths.com/wp-content/uploads/2019/10/Factorising-Quadratics-pdf.pdf</a></p> <p>Answers:</p> <p><a href="https://corbettmaths.com/wp-content/uploads/2019/10/Factorising-Quadratics-Answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/10/Factorising-Quadratics-Answers.pdf</a></p> <p>Solving quadratics by Factorising:</p> <p><a href="https://corbettmaths.com/wp-content/uploads/2019/11/Solving-Quadratics-Factorising-pdf-1.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Solving-Quadratics-Factorising-pdf-1.pdf</a></p> <p>Answers:</p> <p><a href="https://corbettmaths.com/wp-content/uploads/2019/11/Solving-Quadratics-by-Factorising.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Solving-Quadratics-by-Factorising.pdf</a></p>
<b>Quadratics</b>	<p>160 – Roots and Turning Points of Quadratics</p> <p>191 – Solving Quadratics with the Formula</p>	<p>Solving Quadratics (Completing the Square):</p> <p><a href="https://corbettmaths.com/wp-content/uploads/2019/11/Solving-using-Completing-the-Square-answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Solving-using-Completing-the-Square-answers.pdf</a></p> <p>Answers:</p> <p><a href="https://corbettmaths.com/wp-content/uploads/2019/11/Solving-Quadratics-Completing-the-Square-pdf.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Solving-Quadratics-Completing-the-Square-pdf.pdf</a></p> <p>Solving Quadratics (Quadratic Formula):</p> <p><a href="https://corbettmaths.com/wp-">https://corbettmaths.com/wp-</a></p>

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		<a href="https://corbettmaths.com/wp-content/uploads/2019/10/Quadratic-Formula-pdf.pdf">content/uploads/2019/10/Quadratic-Formula-pdf.pdf</a> Answers: <a href="https://corbettmaths.com/wp-content/uploads/2019/11/Quadratic-Formula-answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Quadratic-Formula-answers.pdf</a>
Sketching	99 – Sketching Functions 209c – Completing the Square - Sketching	Sketching Quadratics: <a href="https://corbettmaths.com/wp-content/uploads/2019/12/Quadratics-pdf.pdf">https://corbettmaths.com/wp-content/uploads/2019/12/Quadratics-pdf.pdf</a> Answers: <a href="https://corbettmaths.com/wp-content/uploads/2019/12/Quadratic-Graphs-answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/12/Quadratic-Graphs-answers.pdf</a>
Trigonometry	168 – Trigonometry 173 – Exact Trigonometric Values 195a – Trigonometric Graphs – Sine and Cosine 195b – Trigonometric Graphs – Tangent 196b – Transformation of Trigonometric Functions 201 – The Sine Rule 202 – The Cosine Rule 203 – Area of a Triangle Using Sine 218 – Trigonometry in 3D	3D Trigonometry: <a href="https://corbettmaths.com/wp-content/uploads/2019/11/3D-Trigonometry-and-Pythagoras-1.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/3D-Trigonometry-and-Pythagoras-1.pdf</a> Answers: <a href="https://corbettmaths.com/wp-content/uploads/2019/11/3D-Pythagoras-Trigonometry.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/3D-Pythagoras-Trigonometry.pdf</a> Exact Trig Values: <a href="https://corbettmaths.com/wp-content/uploads/2019/12/Exact-Trig-1.pdf">https://corbettmaths.com/wp-content/uploads/2019/12/Exact-Trig-1.pdf</a> Answers: <a href="https://corbettmaths.com/wp-content/uploads/2019/12/Exact-Trig-Answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/12/Exact-Trig-Answers.pdf</a> Trig Graphs: <a href="https://corbettmaths.com/wp-content/uploads/2019/11/Trig-Graphs.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Trig-Graphs.pdf</a> Answers: <a href="https://corbettmaths.com/wp-content/uploads/2020/02/Trig-Graphs-answers.pdf">https://corbettmaths.com/wp-content/uploads/2020/02/Trig-Graphs-answers.pdf</a>
Straight lines	96 – Straight Line Graphs 133 – Midpoint of a Line on a Graph 159a – Equation of a Straight Line – $y=mx+c$ 159b – Equation of a Straight Line – Gradient and Coordinates 208 – Perpendicular Lines	Parallel Lines and Perpendicular Lines: <a href="https://corbettmaths.com/wp-content/uploads/2019/11/Parallel-Perpendicular-Lines-pdf.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Parallel-Perpendicular-Lines-pdf.pdf</a> Answers: <a href="https://corbettmaths.com/wp-content/uploads/2020/02/Trig-Graphs-answers.pdf">https://corbettmaths.com/wp-content/uploads/2020/02/Trig-Graphs-answers.pdf</a>

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		<p><a href="https://corbettmaths.com/wp-content/uploads/2019/12/Parallel-Perpendicular-Answers.pdf">content/uploads/2019/12/Parallel-Perpendicular-Answers.pdf</a></p> <p>Midpoint of Lines:  <a href="https://corbettmaths.com/wp-content/uploads/2019/11/Coordinate-Geometry-Ratio-pdf-1.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Coordinate-Geometry-Ratio-pdf-1.pdf</a></p> <p>Answers:  <a href="https://corbettmaths.com/wp-content/uploads/2019/11/Coordinate-Geometry-Ratio-answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Coordinate-Geometry-Ratio-answers.pdf</a></p> <p>Equation of a Line:  <a href="https://corbettmaths.com/wp-content/uploads/2019/12/Equation-of-a-Line.pdf">https://corbettmaths.com/wp-content/uploads/2019/12/Equation-of-a-Line.pdf</a></p> <p>Answers:<a href="https://corbettmaths.com/wp-content/uploads/2019/12/Equation-line-answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/12/Equation-line-answers.pdf</a></p>
<b>Simultaneous equations (both linear and non)</b>	<p>140 – Simultaneous Equations Graphically</p> <p>162 – Simultaneous Equations Algebraically</p> <p>211 – Simultaneous Equations with a Quadratic</p>	<p>Simultaneous Equations (linear):  <a href="https://corbettmaths.com/wp-content/uploads/2019/07/Simultaneous-Equations-both-linear.pdf">https://corbettmaths.com/wp-content/uploads/2019/07/Simultaneous-Equations-both-linear.pdf</a></p> <p>Answers:  <a href="https://corbettmaths.com/wp-content/uploads/2019/10/Simultaneous-Equations-Answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/10/Simultaneous-Equations-Answers.pdf</a></p> <p>Simultaneous Equations (non-linear):  <a href="https://corbettmaths.com/wp-content/uploads/2019/07/Simultaneous-Equations-non-linear-pdf.pdf">https://corbettmaths.com/wp-content/uploads/2019/07/Simultaneous-Equations-non-linear-pdf.pdf</a></p> <p>Answers:  <a href="https://corbettmaths.com/wp-content/uploads/2019/11/Simultaneous-Equations-non-linear-answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Simultaneous-Equations-non-linear-answers.pdf</a></p>
Circles	<p>116 – Circle Definitions</p> <p>117 – Area of a Circle</p> <p>118 – Circumference of a Circle</p> <p>149 – Tangents, Arcs, Sectors and Segments</p> <p>167 – Sectors of a Circle</p>	<p>Equation of Circle:  <a href="https://corbettmaths.com/wp-content/uploads/2019/11/Equation-of-a-Circle-pdf.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Equation-of-a-Circle-pdf.pdf</a></p> <p>Answers:  <a href="https://corbettmaths.com/wp-content/uploads/2019/11/Equation-of-a-Circle-answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Equation-of-a-Circle-answers.pdf</a></p>

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	<p>183 – Circle Theorems            184 – Proof of Circle Theorems            197 – Equation of a Circle</p>	<p><a href="https://corbettmaths.com/wp-content/uploads/2019/11/Equation-of-a-Circle-answers.pdf">content/uploads/2019/11/Equation-of-a-Circle-answers.pdf</a>            Circle Theorems:  <a href="https://corbettmaths.com/wp-content/uploads/2019/11/Circle-Theorems.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Circle-Theorems.pdf</a>            Answers:  <a href="https://corbettmaths.com/wp-content/uploads/2019/11/Circle-Theorems-Answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Circle-Theorems-Answers.pdf</a>            Equation of a tangent to a circle:  <a href="https://corbettmaths.com/wp-content/uploads/2019/12/Equation-of-a-Tangent-to-a-Circle.pdf">https://corbettmaths.com/wp-content/uploads/2019/12/Equation-of-a-Tangent-to-a-Circle.pdf</a>            Answers:  <a href="https://corbettmaths.com/wp-content/uploads/2020/01/Equation-Tangent-Answers.pdf">https://corbettmaths.com/wp-content/uploads/2020/01/Equation-Tangent-Answers.pdf</a></p>
Vectors	<p>174 – Introduction to Vectors            219 - Vectors</p>	
Proof	<p>193 – Algebraic Proof</p>	<p>Algebraic Proof:  <a href="https://corbettmaths.com/wp-content/uploads/2019/12/Algebraic-Proof-1.pdf">https://corbettmaths.com/wp-content/uploads/2019/12/Algebraic-Proof-1.pdf</a>            Answers:  <a href="https://corbettmaths.com/wp-content/uploads/2020/02/Proof.pdf">https://corbettmaths.com/wp-content/uploads/2020/02/Proof.pdf</a>            Geometric Proof:  <a href="https://corbettmaths.com/wp-content/uploads/2020/02/Geometric-Proof.pdf">https://corbettmaths.com/wp-content/uploads/2020/02/Geometric-Proof.pdf</a>            Answers:  <a href="https://corbettmaths.com/wp-content/uploads/2019/12/Geometric-Proof-answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/12/Geometric-Proof-answers.pdf</a></p>
<b>Inequalities, linear and quadratic</b>	<p>139 – Solve Linear Inequalities            212 – Solving Quadratic Inequalities</p>	<p>Linear Inequalities:  <a href="https://corbettmaths.com/wp-content/uploads/2019/11/Inequalities.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Inequalities.pdf</a>            Answers:  <a href="https://corbettmaths.com/wp-content/uploads/2019/11/Inequalities-Answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Inequalities-Answers.pdf</a></p>

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		Quadratic Inequalities: <a href="https://corbettmaths.com/wp-content/uploads/2019/11/Inequalities.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Inequalities.pdf</a> Answers: <a href="https://corbettmaths.com/wp-content/uploads/2019/11/Inequalities-Answers.pdf">https://corbettmaths.com/wp-content/uploads/2019/11/Inequalities-Answers.pdf</a>
Kinematics, velocity time graphs	142 – Compound Units 143 – Distance-Time Graphs 216a – Velocity-Time Graphs 216b – Rate of Change	
Histograms	205 - Histograms	
Cumulative frequency	186 – Cumulative Frequency	
Scatter graphs	129 – Scatter Diagrams	
Functions	99 – Sketching Functions 214a – Inverse Functions – Introduction 215 – Composite Functions	Function Notation, Composite Functions, Inverse Functions: <a href="https://corbettmaths.com/wp-content/uploads/2019/10/Functions.pdf">https://corbettmaths.com/wp-content/uploads/2019/10/Functions.pdf</a> Answers: <a href="https://corbettmaths.com/wp-content/uploads/2020/05/Functions-Answers.pdf">https://corbettmaths.com/wp-content/uploads/2020/05/Functions-Answers.pdf</a>