

GCSE Maths Revision Guide (Higher Tier)



GCSE Maths revision guide contents

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Holiday Revision Sessions

Wednesday 16th April

Sign up details to be sent out w/c 31st March

Exam Dates

- **Paper 1 (non-calculator) Thursday 15th May 2025 AM**
- **Paper 2 (calculator allowed) Wednesday 4th June 2025 AM**
- **Paper 3 (calculator allowed) Wednesday 11th June 2025 AM**

Equipment Needed

- **Paper 1**
- **Black pen, pencil, ruler, rubber, sharpener, compass, protractor**
- **Paper 2 and Paper 3**
- **Scientific Calculator, Black pen, pencil, ruler, rubber, sharpener, compass, protractor**

****If you need tracing paper in your exam, put your hand up and ask for it****

Maths revision top tips

1. Before you start revising, make sure your notes are organised and that you have a list of topics to cover.

- See page 5 for a list of topics

2. Before your start revising, make sure you know where to find some practice questions.

- See page 14 for a useful website with practice questions.

3. Remove distractions- give revision your full attention!

- Put you phone in another room and turn off any other distracting devices.

4. Test yourself regularly.

- Complete a couple of exam questions on each topic. This will help you to plan which topics you need to revise more and any that you are already confident with.

5. Plan exactly when you are going to revise and stick to the plan!

- See page 11 for a revision timetable and some tips for making one

6. Reward yourself!

- After doing some revision, give yourself a treat. Time to unwind is just as important as time to revise.

7. Do some practice questions.

- Dont spend time just reading through your notes, the best way to revise maths is to do actual.

8. Practice using your calculator.

- Not all calculators are the same so take the time to get used to yours. Bring your own calculator to school rather than borrowing one.

9. Ask for help if you are struggling with a topic.

- Ask your teacher or come along to the KS4 drop in session on Tuesday lunchtimes in Maths Base Room if you are struggling with some maths.

GCSE Maths Formula to Learn (Higher Tier)

Compound interest	$Total\ accrued = P \left(1 + \frac{r}{100} \right)^n$
Equation of a straight line	$y - y_1 = m(x - x_1)$ or $y = mx + c$
Gradient of a straight line	$\frac{\text{change in } y}{\text{change in } x}$
Equation of a circle	$x^2 + y^2 = r^2$
Speed	$speed = \frac{\text{distance}}{\text{time}}$
Density	$density = \frac{\text{mass}}{\text{volume}}$
Pressure	$pressure = \frac{\text{force}}{\text{area}}$
Pythagoras Theorem	$a^2 + b^2 = c^2$
Area of a rectangle	$Base \times height$
Area of a triangle	$\frac{base \times perpendicular\ height}{2}$
Area of any triangle	$\frac{1}{2}absinC$
Area of a parallelogram	$Base \times height$
Area of a trapezium	$\frac{1}{2}(a + b)h$
Area of a circle	πr^2
Circumference of a circle	πd
Quadratic Formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

The topics highlighted are given in the exam aid that is given for each paper.

Continues on the next page

Volume of a cuboid	$length \times width \times height$
Volume of a prism	$area\ of\ cross\ section \times length$
Volume of a pyramid	$\frac{1}{3} (area\ of\ base \times height)$
Trigonometric ratios	$S^0_h\ C^a_h\ T^0_a$
Sine rule	$\frac{a}{\sin A} = \frac{b}{\sin B} \quad or \quad \frac{\sin A}{a} = \frac{\sin B}{b}$
Cosine rule	$a^2 = b^2 + c^2 - 2bc \cos A$
Cosine rule (for finding angles)	$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$
Median	$\begin{matrix} \text{Middle when in order} \\ (n + 1) \div 2 \end{matrix}$
Mean	$Add\ up\ and\ divide\ by\ how\ many$
Range	$biggest\ value - smallest\ value$
Lower Quartile	$\frac{(n + 1)}{4}$
Upper Quartile	$\frac{3(n + 1)}{4}$
Inter-Quartile Range (IQR)	$UQ - LQ$
Percentage Change	$\frac{difference}{original\ value} \times 100$
Pie Charts	$\frac{group\ frequency}{total\ frequency} \times 360$
Stratified Sampling	$\frac{group\ frequency}{total\ frequency} \times sample\ size$
Histograms	$frequency\ density = \frac{frequency}{class\ width}$
Independent Events (Probability)	$P(A\ and\ B) = P(A) \times P(B)$
Probability	$P(A\ or\ B) = P(A) + P(B) - P(A\ and\ B)$
Probability	$P(A\ and\ B) = P(A\ given\ B)P(B)$

The topics highlighted are given in the exam aid that is given for each paper.

GCSE Maths Graded Ladder - Higher Topics Only

With fluency of number I can...

Grade	Skill	R	A	G
9	calculate the lower and upper bounds of harder compound measures involving a combination of sums and fractions			
8	calculate the lower and upper bounds of compound measures			
	calculate using fractional numbers with negative and fractional powers			
	rationalise the denominator where there are 2 terms in denominator			
7	apply the product rule for counting			
	calculate integers with fractional powers			
	expand brackets involving surds			
	rationalise the denominator where there is one term in denominator			
6	calculate numbers with negative powers			
	estimate powers and roots of any given positive number			
	write a recurring decimal as a fraction			
5	calculate the lower and upper bounds of a rounded answer			
	estimate a calculation			
	leave my answers in term of pi and as a fraction where necessary			
	simplify surds, including adding and subtracting surds			
4	apply the laws of indices for multiplied and divided terms			
	find the reciprocal of any number			
	perform arithmetic with mixed fractions			
	simplify the result of indices with value 0 or 1			
	use prime factor decomposition to find the HCF and LCM			
	write large and small numbers in standard form			
3	apply the order of operations to calculations			
	calculate with negative numbers			
	find square numbers, cube numbers and square roots			
	perform arithmetic with decimals			
	perform arithmetic with proper fractions			
	round to any number of significant figures			
	write any integer using prime factors			

With manipulation of algebra I can ...

Grade	Skill	R	A	G
9	complete the square for any quadratic and solve the subsequent equation			
	find the equation of a tangent to a circle at any given point			
	find the maximum/minimum point after any transformation			
	solve any equation involving algebraic fractions			
8	add or subtract algebraic fractions			
	complete the square and solve the equation when the x^2 coefficient is 1			
	find all solutions to a linear and quadratic simultaneous equation			
	transform graphs of the form $f(ax)$ and $af(x)$ where a can also be -1			
7	change the subject of a formula where the unknown appears on both sides			
	complete the square for a quadratic expression where x^2 coefficient is 1			
	factorise and solve quadratic expressions (where coefficient of x^2 is not 1)			
	find the equation of a perpendicular line			
	plot and recognise circle and trigonometric graphs			
	simplify algebraic fractions using factorising skills			
	solve a quadratic inequality in one variable			
	solve any quadratic equation by factorising or using the formula			
	transform graphs of the form $f(x+a)$ and $f(x)+a$			
6	use iteration to find an approximate solution to an equation			
	find the n th term of a quadratic sequence			
	solve a pair of simultaneous equations with different coefficients			
	solve a series of linear inequalities on a graph			
	state the turning points on a quadratic graph by looking at it			
	substitute any value into a function or composite function			
5	use the formula to solve a quadratic equation where the x^2 coefficient is 1			
	change the subject of a formula where the unknown appears on one side			
	expanding double brackets where the coefficient of x^2 is not 1			
	factorising and solve quadratic expressions where coefficient of x^2 is 1			
	know the difference between an expression, equation and identity			
	plot a quadratic graph including finding an approximate solution			
	plot a straight line graph of the form $ax + by = c$			
	plot and recognise cubic and reciprocal graphs			
	recognise the difference of two squares and factorise them			
	solve a linear equation with one or two negative unknowns			
	solve a linear inequality including showing the solution on a number line			
	solve a pair of simultaneous equations with one coefficient the same			
	solve simultaneous equations on a graph			
	state the equation of a line given two points			
	state the equation of a parallel line			
	state the gradient and y-intercept of any straight line graph			

4	continue a Fibonacci or geometric sequence			
	expand a combination of linear brackets			
	expand double brackets where the coefficient of x^2 is 1			
	factorise a linear expression			
	find the n th term of a linear, decreasing sequence			
	plot a straight line graph of the form $y = ax + b$			
	solve a linear equation with positive unknowns on both sides			
	solve an equation including single brackets, negatives and fractions			
	substitute a negative number into an expression or formula			
3	create and use a formula			
	draw a straight line graph of the form $x=k$ and $y=k$			
	draw and interpret a conversion graph			
	expand a single bracket			
	find the n th term of a linear, increasing sequence			
	form and solve a linear two-step equation			
	simplify multiplied expressions including using index notation			
	state the mid-point of a line			
	substitute a positive number into an expression or formula			

With ratio, proportion & percentages I can...

Grade	Skill	R	A	G
9	construct and interpret an equation that describes any direct or inverse proportion problem			
8	calculate direct proportion using algebraic functions such as squares			
	calculate indirect proportion using algebraic functions			
7	calculate direct proportion using simple algebraic functions such as $2x$			
	interpret the gradient of a straight line graph as a rate of change			
	use scale factors to find missing lengths, areas and volumes			
6	find a missing length in similar shapes			
	state the gradient of a curve by using a tangent line			
5	calculate the pressure of a force on an area			
	change between compound units such as speed and density			
	find reverse percentages			
	set up and solve problems involving growth & decay e.g. compound interest			
	work confidently with percentages greater than 100%			
4	calculate percentage profit/loss			
	calculate proportion using the unitary method (including inverse proportion)			
	calculate the density, mass or volume of an object			
	calculate the speed, distance or time of an object			
	express a multiplicative relationship between two quantities			

	find the simple interest of money			
	interpret and draw a distance-time graph			
	link ratios to fractions and to linear functions			
	share an amount in a given ratio			
	use a multiplier with percentages on a calculator			
3	convert between fractions, decimals and percentages (including ordering)			
	create a scale drawing			
	find the percentage increase & decrease of an amount			
	use and interpret map scales			
	write one number as a fraction/percentage of another			

Using geometrical reasoning I can...

Grade	Skill	R	A	G
9	apply a combination of sine and cosine rules in one problem			
	find the area and surface area of a frustum			
	prove the alternate segment theorem			
8	apply the sine and cosine rule to any triangle			
	prove that 3 points are in a straight line using vector pathways			
	use the alternate segment theorem to find a missing angle			
	use trigonometry in a 3-D situation			
7	apply a series of circle theorems to find a missing angle			
	describe a vector pathways around a shape involving mid-points			
	find the area and surface area of a curved 3D shape			
	find the area of any triangle using the trigonometric formula			
	use Pythagoras' Theorem in a 3-D situation			
6	apply a circle theorem to find a missing angle			
	enlarge a shape with centre of enlargement and negative scale factor			
	produce a series of transformations			
5	calculate the exterior and interior angle in a regular polygon			
	construct loci from a series of information			
	convert between different area units			
	describe a simple vector pathways around a shape			
	describe any transformation			
	enlarge a shape with centre of enlargement and fractional scale factor			
	find the arc length and sector area			
	find the area of any compound 2-D shape			
	find the volume and surface area of a prism including a cylinder			
	identify congruent triangles by ASA, SAS, SSS and RHS			
	state the key trigonometric values such as $\sin 90 = 1$			
	use Pythagoras' Theorem to find the distance between 2 points			

	use trigonometry to find a missing angle or length			
4	calculate angles in parallel lines			
	calculate the circumference and area of a circle			
	construct a single loci from a given point			
	enlarge a shape with centre of enlargement and positive scale factor			
	find the area of trapezium			
	find the volume and surface area of a cuboid			
	prove why there are 180° in a triangle and 360° in a quadrilateral			
	translate a shape using a vector			
	use bearings			
	use Pythagoras' Theorem to find the missing length			
	work with column vectors including drawing, adding and multiples			
3	accurately draw the net of a 3-D shape			
	construct a triangle given ASA, SAS, SSS or RHS			
	construct perpendicular and angle bisectors			
	draw the plan and elevations of a 3-D shape			
	find the area of a triangle and a parallelogram			
	find the missing angles in a triangle			
	find vertically opposite angles			
	label the key features of a circle such as radius			
	reflect a shape in a line where the equation of the line is given			

With data and probability I can...

Grade	Skill	R	A	G
9	find the median from a histogram with unequal class intervals			
8	complete the frequency table from a histogram with unequal class intervals			
7	interpret the equation of the line of best fit			
6	draw a box plot			
	draw a cumulative frequency curve			
	find quartiles and percentiles from a cumulative frequency diagram			
	find the median from a frequency table (including grouped)			
	state the equation of the line of best fit			

5	calculate the inter-quartile range from a list of data			
	calculate values needed for a stratified sample			
	construct a Venn diagram and calculate probabilities from it			
	draw a tree diagram without replacement and calculate probabilities from it			
	find the mode and mean from a grouped frequency table			

	increasing a sample size increases the link to the theoretic probability			
	interpolate and extrapolate data using the line of best fit			
	state the effect on averages when the original data is transformed			
4	calculate the relative frequency of an event			
	draw a histogram with equal class intervals			
	draw a scatter diagram and add the line of best fit onto it			
	draw a tree diagram with replacement and calculate probabilities from it			
	draw and interpret a frequency tree			
	find the mode, mean and range from a frequency table			
	informally recognise an outlier			
	interpret a pie chart			
	state the correlation of data in a scatter diagram			
3	all probabilities sum to 1			
	calculate probabilities from a two-way table			
	construct a sample space diagram			
	create a two-way table from words			
	design a data collection sheet			
	design a suitable questionnaire			
	draw a pie chart using the formula			
	draw a stem and leaf diagram including finding averages from it			
	draw and interpret a frequency polygon			
	draw and interpret a time-series graph			
	find the mean from a list of data			
	identify mutually exclusive outcomes			
	use the different averages to compare two data sets			

Revision Planner Template

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
8am							
9am							
10am							
11am							
12pm							
1pm							
2pm							
3pm							
4pm							
5pm							
6pm							
7pm							
8pm							
9pm							

Some useful tips:

- Include breaks between revision.
- Fill in other commitments first.
- Be specific on which topics you want to revise and when.
- Revise at a time of day that works for you.
- Plan rest days- it is OK to take a day off!

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What should I be doing outside of Maths Lessons

- Complete the SPARX set by your teacher this should take about 30 minutes each week. These topics have been selected as they appear between 70% - 100% of the time on one of the 3 papers. [Sparx Learning - Select School](#) (you have your own personal log in details)
- Finish the past papers which you start in your P6 and Friday's lesson. If you are unable to attend please ask your teacher for a copy of the paper. Model solutions will be posted onto Classcharts so you can check your work.
- The Fluency Fix Up on SPARX, these are follow-up questions designed to help you improve on areas you struggled with on the most recent mocks.
- Use the topic ladders in this revision guide to identify which other topics you need to revise by answering a couple of exam questions on a topic from here [gcsepage.pdf](#)
- Use SPARX to locate the video to review the topic or use the following videos [GCSE \(Edexcel\) Revision | 1st Class Maths](#). Email/ask Mr Cann (jcann@nclt.academy) or Mrs Uglow (luglow@nclt.academy) if you can't locate the topic.

- **Complete past papers;**

[Maths Genie • Edexcel GCSE Maths Past Papers, Mark Schemes, Model Answers and Video Solutions](#)

Mark schemes and model solutions are attached so you can check your work.

- **If you are stuck on a question, can't find a topic or need help come to the Maths Base Room for GCSE Maths Drop in clinic on a Tuesday lunchtime or ask in a lesson.**
- **Finally, it's not too late to start revising and see an improvement in your grade so let's get this Maths revision going!**