

GCSE Mathematics

To ensure that you achieve the highest grade possible you should be practising mathematical skills outside of maths lessons.

You are set homework each week and should also be doing independent revision.

Make sure you are using your Hegarty Maths account. There is a link to this on RM unify. Your login details are your name and date of birth.

Maths 'Help Desk' runs after school on Thursdays in F6b and FC1. You should bring the work you need help on or know the title of the topic you would like resources provided for. We will also have some practice exam questions for you to do.

Contact details for Y11 Maths teachers are:

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You will need a scientific calculator and a geometry set in your mathematics exams. You must bring these to every maths lesson so that you know how to use them correctly. You need a Casio FX-83GT or better and these are available from school for the discounted price of £6.50. We also sell geometry sets for £1.50.

The specification we are following is **AQA GCSE Mathematics 8300**. We currently have revision guides for this specification available for sale at a price of £2 (revision guide only) or £4 (includes exam questions).

GCSE Mathematics is assessed solely on exams at the end of year 11.

There are three exams, two of these you will need your scientific calculator for.

GCSE Topic List – Foundation

Number

Properties of number
Fractions
Decimals
Percentages
Calculating with percentages
Factors and multiples
Indices
Rounding
Standard form

Algebra

Manipulating Algebra
Algebra and graphs
Quadratics
Rearranging formulae
Identities
Coordinates and Linear Graphs
Equations
Inequalities
Quadratic graphs
Real life graphs
Sequences
Simultaneous equations
Sketching graphs
Solving quadratic equations

Ratio, proportion and rates of change

Calculating with percentages
Direct and inverse proportion
Growth and decay
Ratio and proportion

Geometry and measures

Angles
Circumference and area
Congruence and similarity
Constructions and loci
Measures
Perimeter and area
Properties of polygons
Pythagoras' theorem
Scale diagrams and bearings
Transformations
Trigonometry
Vectors
Volume
2D representations of 3D shapes

Probability

Probability

Statistics

Collecting and representing data
Scatter graphs
Statistical measures
Venn diagrams

GCSE Topic List – Higher

Number

Decimals
Factors and multiples
Fractions
Fractions and decimals
Indices
Factors, multiples and primes
Percentages
Rounding
Standard form
Surds

Algebra

Manipulating algebra
Quadratics
Rearranging formulae
Identities
Algebraic fractions
Coordinates and linear graphs
Equation of a circle
Equations
Quadratic graphs
Inequalities
Numerical methods
Pre-calculus and area under a curve
Real life graphs
Sequences
Simultaneous equations
Sketching graphs
Transforming functions

Probability

Probability

Ratio, proportion and rates of change

Direct and inverse proportion
Calculating with percentages
Gradients and rates of change
Growth and decay
Ratio and proportion

Geometry and measures

Angles
Angles, scale diagrams and bearings
Circumference and area
Circle theorems
Congruence and similarity
Constructions and loci
Measures
Properties of polygons
Perimeter and area
Pythagoras' theorem and basic trigonometry
Scale diagrams and bearings
Sine and cosine rules
Transformations
Vectors
Volume
2D representations of 3D shapes

Statistics

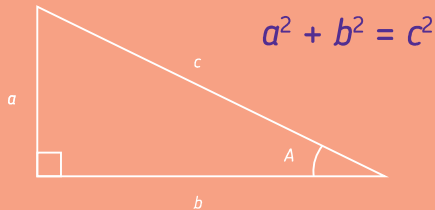
Collecting and representing data
Scatter graphs
Statistical measures
Venn diagrams

GCSE Maths

Formulae you'll need to know

Pythagoras' theorem

In any right-angled triangle where a , b and c are the length of the sides and c is the hypotenuse:



Trigonometry formulae

In any right-angled triangle ABC where a , b and c are the length of the sides and c is the hypotenuse:

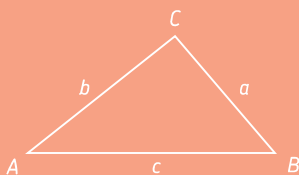
$$\sin A = \frac{a}{c} \quad \cos A = \frac{b}{c} \quad \tan A = \frac{a}{b}$$

In any triangle ABC where a , b and c are the length of the sides:

$$\text{sine rule: } \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\text{cosine rule: } a^2 = b^2 + c^2 - 2bc \cos A$$

$$\text{Area} = \frac{1}{2} ab \sin C$$



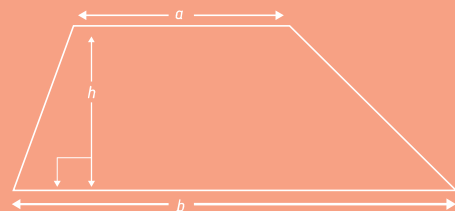
Circumference and area of a circle

Where r is the radius and d is the diameter:

$$\text{Circumference of a circle} = 2\pi r = \pi d$$

$$\text{Area of a circle} = \pi r^2$$

Perimeter, area, surface area and volume formulae



Where a and b are the lengths of the parallel sides and h is their perpendicular separation:

$$\text{Area of a trapezium} = \frac{1}{2} (a + b) h$$

$$\text{Volume of a prism} = \text{area of cross section} \times \text{length}$$

Compound interest

Where P is the principal amount, r is the interest rate over a given period and n is the number of times that the interest is compounded:

$$\text{Total accrued} = P \left(1 + \frac{r}{100} \right)^n$$

The quadratic formula

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Probability

Where $P(A)$ is the probability of outcome A and $P(B)$ is the probability of outcome B :

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$P(A \text{ and } B) = P(A \text{ given } B) P(B)$$

GCSE Mathematics

How to approach problem solving

Ask

- What can I see?
- What do I know?

Look at the information you're given – it's there for a reason. How can this information be used to solve the problem?



Question

- What do I need to find out?

Decide what the question actually wants you to do. Identify the information you still need.



Analyse

- How does what I see, link with what I need to know?
- What are the relationships that might join them?

Decide which skills and techniques you need to solve the problem.



Check your answer

– does it make sense?