

My mathematical journey

What do I need to remember from before?

Solving linear equations (A4)

Rearranging formulae (A5)

$$y = mx + c \text{ (A6)}$$

Linear inequalities (A8)

What will I learn about in this unit?

Solving problems with graphs

Finding lines parallel and perpendicular to others

Solving simultaneous equations

Plotting inequalities in two dimensions

Where does this lead?

Quadratic graphs (A12)

Non-linear simultaneous equations, non-linear inequalities (A14)

Tangents and normal (A15)

Gradient of a curve (A16)

Using graphs to represent complex problems (A Level Maths)

Key words and symbols: what I need to say and write accurately

Word	Explanation
y-intercept	where a graph crosses the y -axis
x-intercept or root	where a graph crosses the x -axis
satisfy	a number <u>satisfies</u> an equation when it solves the equation
gradient	the steepness of a line
parallel	describing two lines that have the same gradient, so will never intersect
perpendicular	describing two lines that meet at right angles to each other
to intersect	to cross – we say two lines intersect
simultaneously	at the same time
 	is <i>parallel to</i>
⊥	is <i>perpendicular to</i>
region	an area on a graph
boundary	a line that marks the edge of a region

Fingertip facts: what I need to learn by heart

If a point (x, y) lies on a line, its coordinates can be substituted for y and x in the equation of the line and they will satisfy the equation.

The gradient of a line is the amount up/down it moves for every one unit right. We can work this out by calculating the ratio $\frac{\text{vertical}}{\text{horizontal}}$ between two points on the line.

The gradients of parallel lines are the same.

The gradients of perpendicular lines are the negative reciprocal of each other: $+\frac{a}{b} \perp -\frac{b}{a}$

On the **y**-axis, $x = 0$. On the **x**-axis, $y = 0$.

When we solve simultaneous equations, we find the point of intersection of graphs of the two equations.



My mathematical journey

What do I need to remember from before?

Multiplying to scale (NP3, NP10)

Reflective and rotational symmetry (GM2)

Properties of shapes (GM2)

What will I learn about in this unit?

Congruence and similarity

Congruent transformations: translation, reflection, rotation

Similar transformations: enlargement

Where does this lead?


Trigonometry (GM5)

Area and volume in similar solids (GM8)

Problems with congruence and similarity (GM11)

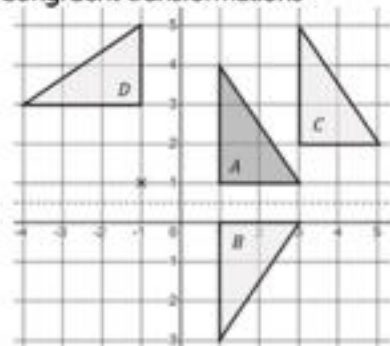
Transforming graphs (A15)

Key words and symbols: what I need to say and write accurately

Word	Explanation
congruent, \cong	identical in size and shape, but not necessarily orientation or direction
transformation	a mathematical change, using translation, rotation, reflection or enlargement
image	a shape <i>after</i> a transformation has happened
vector	<p>a mathematical object that tells you how far to move and in what direction it can be shown with an arrow or with column notation</p> <p>e.g. this arrow and column vector both communicate "one left, two down"</p> <div style="display: flex; align-items: center; justify-content: center;"> $\begin{pmatrix} -1 \\ -2 \end{pmatrix}$  </div>
similar	same shape, all angles the same, but one an enlargement of the other (all corresponding sides in the same ratio)

Fingertip facts: what I need to learn by heart

Congruent transformations



A to B is a reflection in the line $y = \frac{1}{2}x$

A to C is a translation by the vector $\begin{pmatrix} 2 \\ 1 \end{pmatrix}$

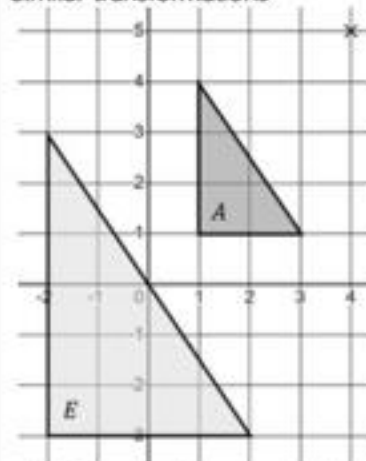
A to D is a rotation 90° anticlockwise around the centre $(-1, 1)$.

Reflections need a mirror line.

Translations need a vector.

Rotations need an angle, direction and centre.

Similar transformations



A to E is an enlargement of scale factor 2 from $(4, 5)$.

Enlargements need a scale factor and centre.

My mathematical journey

What do I need to remember from before?

Powers and roots (NP4)
 Substitution and rearranging a formulae (A5)
 Angles in triangles (GM2)
 Similarity (GM4)

What will I learn about in this unit?

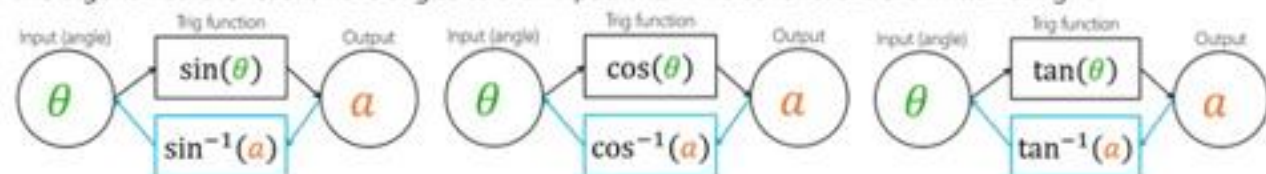
Pythagoras' Theorem
 Trigonometry in right-angled triangles
 Exact values in surd form

Where does this lead?

Advanced length and area (GM9)
 Trigonometric graphs (A13)
 A Level mathematics, physics, engineering and more

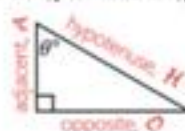
Key words and symbols: what I need to say and write accurately

The trigonometric functions have angles as their input. Their inverse functions are written using $^{-1}$.



The **hypotenuse** is the longest side in a right-angled triangle, opposite the right angle.

The other two sides are called the **adjacent** and **opposite**. They change depending on the angle you look at.

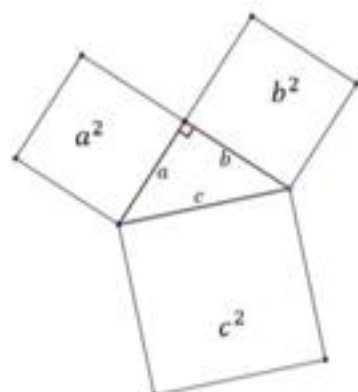


Fingertip facts: what I need to learn by heart

Pythagoras' Theorem

For any right-angled triangle,

$$a^2 + b^2 = c^2$$

Trigonometry

Three equations:

$$\sin(\theta) = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos(\theta) = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan(\theta) = \frac{\text{opposite}}{\text{adjacent}}$$

A mnemonic to help you remember the equations:

S^OH C^AH T^OA

The exact values of sine, cosine and tangent for key angles:

Angle, θ	30°	45°	60°
$\sin \theta$	$\frac{\sqrt{1}}{2} = \frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$
$\cos \theta$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{1}}{2} = \frac{1}{2}$
$\tan \theta$	$\frac{1}{\sqrt{3}}$	1	$\frac{\sqrt{3}}{1} = \sqrt{3}$

My mathematical journey

What do I need to remember from before?

Angle facts (GM2)

Area and perimeter (GM3)

Rearranging formulae (A5)

What will I learn about in this unit?

Naming the parts of a circle

Finding the area and perimeter of circles and sectors of circles

Finding angles in circles using circle theorems

Where does this lead?

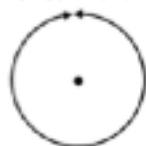
Surface area and volume (GM8)

Advanced length and area (GM9)

Key words and symbols: what I need to say and write accurately

The circumference is the perimeter of a circle.

We use C for 'circumference'.



We use d for 'diameter' and r for 'radius'.



Semicircle
A half circle



Quadrant
A quarter circle



Concentric circles share the same centre

Fingertip facts: what I need to learn by heart

$$\pi \approx 3.14$$

Circle formulae

Circumference: $C = \pi d$ or $C = 2\pi r$

Area: $A = \pi r^2$

Sector formulae

We use l for 'arc length'.

Arc length: $l = \frac{\theta}{360} \pi d$

Sector area: $A = \frac{\theta}{360} \pi r^2$

Circle theorems

A radius and a tangent are perpendicular.



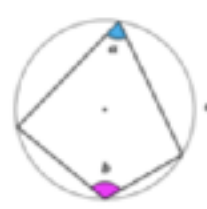
The angle at the centre is twice the angle at the circumference (subtended by the same arc).



The angle in a semicircle is 90° .

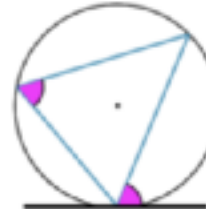


Angles at the circumference subtended by the same arc are equal. (Angles in the same segment are equal).



$$a + b = 180^\circ$$

Opposite angles in a cyclic quadrilateral are sum to 180° .



The Alternate Segment Theorem.

My mathematical journey

What do I need to remember from before?

Percentage multipliers (NP8, NP10)

Proportional reasoning (NP10)

Cartesian graphs (A6, A9, A10)

Manipulating algebra (A5, A10)

What will I learn about in this unit?

Reverse percentages

Simple interest

Direct and inverse proportion

Compound units

Combining ratios

Where does this lead?

Compound interest (NP16)

Proportion with squares, cubes and roots (NP16)

Instantaneous and average rates of change (A16)

Areas under graphs (A16)

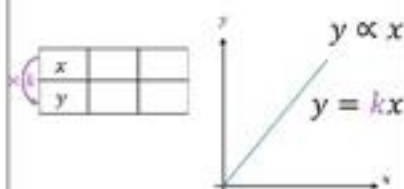
Key words and symbols: what I need to say and write accurately

Word	Explanation
p.a.	<i>per annum</i> , Latin for "every year"
direct proportion	as one amount increases, the other increases <u>at the same rate</u>
k	the <u>constant of proportionality</u> , which is the rate of change
\propto	<i>is proportional to</i>
inverse proportion	as one amount increases, the other <i>decreases</i> at the same rate
density	a measure of how spread out particles in an object are
pressure	a measure of how spread out a force is
speed	a measure of distance per unit of time
compound units	a measure combining two other measures

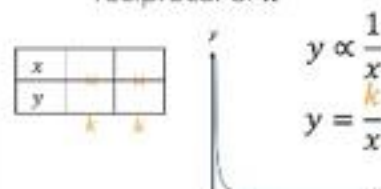
Fingertip facts: what I need to learn by heart

To calculate a percentage: **original \times multiplier = new**To return to the original whole: **original = $\frac{\text{new}}{\text{multiplier}}$**

Direct Proportion

As one increases, the other increases at the same rate. y is proportional to x 

Inverse Proportion

As one increases, the other decreases at the same rate. y is proportional to the reciprocal of x 

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

$$\text{Pressure} = \frac{\text{force}}{\text{area}}$$

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

My mathematical journey

What do I need to remember from before?

Angle facts on lines, parallel lines and in polygons (GM2)

Bearings (GM2)

Constructions and loci (GM1)

Symmetry (GM2)

What will I learn about in this unit?

Interior and exterior angles in polygons

Reasoning with angle problems

Types and properties of polyhedra

Representing 3D shapes: drawing, isometric drawing, plans and elevations, nets

Constructions and loci problems

Where does this lead?

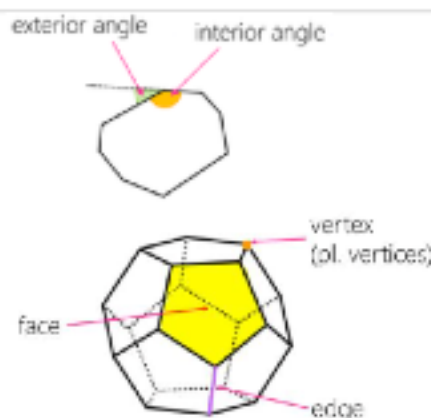
Surface area and volume (GM8)

Advanced length and area (GM9)

Solving geometric problems (GM11)

Key words and symbols: what I need to say and write accurately

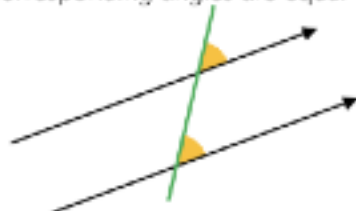
Word	Explanation
polyhedron	a 3D solid with flat, polygon faces (no curved faces)
prism	a polyhedron with a constant cross-section
pyramid	a polyhedron with a decreasing cross-section to the apex
plan	the view when you look down at a 3D shape from above
elevation	the view when you look at a 3D shape from the front or the side
net	what you see when you unfold a 3D shape
bisector	'bisect' means 'cut in half'. A bisector is a line that cuts another in half.
perpendicular	perpendicular lines meet at a right angle.
equidistant	equidistant means an equal distance from two points or lines.
locus (pl. loci)	The path of all points that fit a condition.



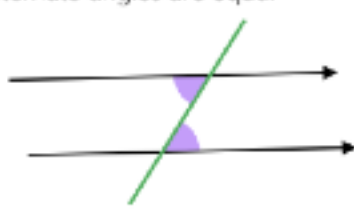
Fingertip facts: what I need to learn by heart

A bearing is measured clockwise from North and reported with three figures, e.g. 070°.

Corresponding angles are equal



Alternate angles are equal



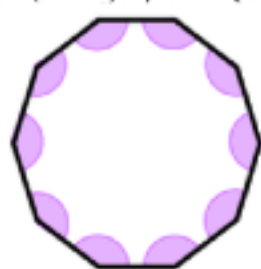
Co-interior angles sum to 180°



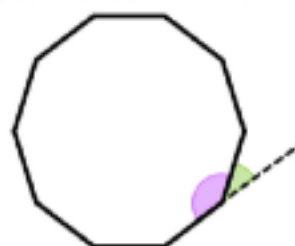
The sum of the exterior angles in any polygon (an n -gon) is 360° .



The sum of the interior angles in any polygon (an n -gon) is $180(n - 2)^\circ$.



An adjacent interior and exterior angle sum to 180° .



My mathematical journey

What do I need to remember from before?

Median (NP1, SP1)
 Mean (NP2, SP1)
 Mode (SP1)
 Range (NP2, SP1)
 Types of data (SP1)
 Comparing summary statistics (SP1)

What will I learn about in this unit?

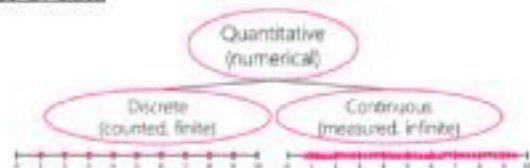
Presenting and analysing sets of continuous data.
 Estimate measures of location and spread for continuous data
 Comparing continuous data sets through charts and summary statistics.

Where does this lead?

Advanced data analysis from histograms and frequency polygons (SP6)
 Advanced statistical analysis (GCSE Statistics; A Level Statistics; Core Maths)

Key words and symbols: what I need to say and write accurately

Types of data

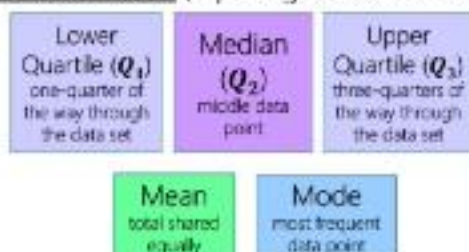


Symbols

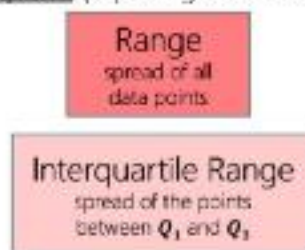
\bar{x} – 'the mean'

Σ – 'the sum of' (this is the capital Greek letter 'sigma')

Measures of location (capturing where the data set is)



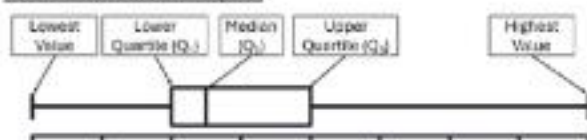
Measures of spread (capturing how wide the data set is)



A class interval is a group of data, e.g. $2 \leq x < 5$.

Fingertip facts: what I need to learn by heart

How to draw a boxplot



How to find the position of the median and quartiles

For discrete data:

Q_1 is in position $\frac{n+1}{4}$

Q_2 is in position $\frac{n+1}{2}$

Q_3 is in position $\frac{3(n+1)}{4}$

For continuous data:

Q_1 is in position $\frac{n}{4}$

Q_2 is in position $\frac{n}{2}$

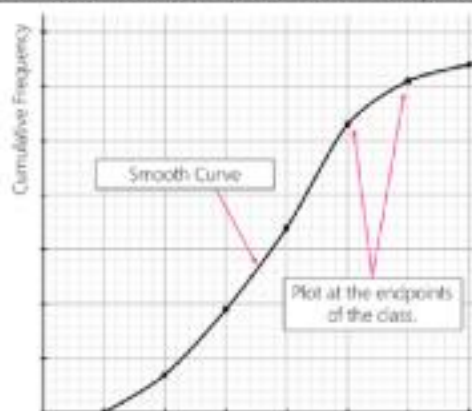
Q_3 is in position $\frac{3n}{4}$

(where n is the size of the data set)

How to find the mean from a frequency table

$\bar{x} = \frac{\sum fx}{\sum f}$, where x is a value in a data set (or the midpoint of a class) and f its frequency.

What to remember about a cumulative frequency curve



My mathematical journey

What do I need to remember from before?

Probability, Venn diagrams and working systematically (SP5)

Linear inequalities (A8)

Types of number (NP4)

What will I learn about in this unit?

Thinking logically

Sets, subsets and set notation

Sets on Venn diagrams

Probability of A AND/OR B

Where does this lead?

Advanced probability problems with independent or dependent events (SP7)

Algebraic proof (A17)

Statistics in Core Maths and A-Level Maths

Key words and symbols: what I need to say and write accurately

$$\xi$$

The universal set. All elements being considered.



$$A = \{ \dots \}$$

Set A .



$$A'$$

The complement of A . Elements not in A .



$$A \cap B$$

The intersection of A and B .
Elements in both A AND B .



$$A \cup B$$

The union of A and B .
Elements in either A OR B .



$$A \subset B$$

A is a subset of B .
Every element in A is also in B .



The solution set to an inequality can be written in set notation. For instance, $\{x : x > 3\}$ reads "the set of all x such that x is greater than 3."

Fingertip facts: what I need to learn by heart

If events A and B are mutually exclusive, $P(A \cup B) = P(A) + P(B)$.

If events A and B are independent, $P(A \cap B) = P(A) \times P(B)$.

If events A and B are not mutually exclusive $P(A \cup B) = P(A) + P(B) - P(A \cap B)$.

My mathematical journey

What do I need to remember from before?

Product of prime factors (NP4)

HCF and LCM (NP3)

Equivalent fractions and decimals (NP8)

Bounds and error (NP9)

What will I learn about in this unit?

Uses of the product of prime factors

Types of rational number

Error in measurement and calculations

Where does this lead?

Number theory (after A-Level)

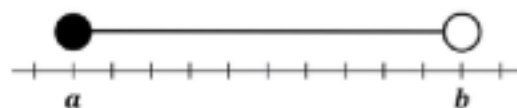
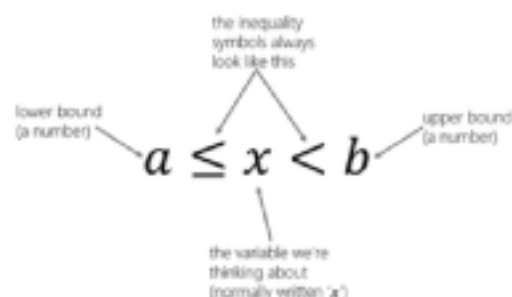
Rationalising fractions (NP15)

Understanding accuracy in advanced maths, engineering and science (A-Level and beyond)

Key words and symbols: what I need to say and write accurately

Word/phrase	Explanation
highest common factor (HCF)	the biggest number that is a factor of all the numbers in question e.g. $\text{HCF}(16, 20) = 4$
lowest common multiple (LCM)	the smallest number that is a multiple of all the numbers in question e.g. $\text{LCM}(16, 20) = 80$
rational number	any number that can be written as a fraction, including integers, terminating and recurring decimals
terminating decimal	a number whose decimal places stop, e.g. 0.2 or 1.81423
recurring decimal	a number whose decimal places continue forever in a repeating pattern, e.g. $0.\dot{2} = 0.222222 \dots$ or $0.5\dot{6}0\dot{8} = 0.5608608608608 \dots$
truncate	always round down

An error interval uses inequalities to show the range of values a number could be within. We can show it with inequalities *and* on a number line.



Fingertip facts: what I need to learn by heart

The fraction and decimal equivalents for ninths and thirds.

Fraction	$\frac{1}{9}$	$\frac{2}{9}$	$\frac{3}{9} = \frac{1}{3}$	$\frac{4}{9}$	$\frac{5}{9}$	$\frac{6}{9} = \frac{2}{3}$	$\frac{7}{9}$	$\frac{8}{9}$	$\frac{9}{9} = 1$
Decimal	$0.\dot{1}$	$0.\dot{2}$	$0.\dot{3}$	$0.\dot{4}$	$0.\dot{5}$	$0.\dot{6}$	$0.\dot{7}$	$0.\dot{8}$	$0.\dot{9} = 1$

The prime numbers less than 100:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97

My mathematical journey

What do I need to remember from before?

Adding and subtracting expressions (A2)
 Multiplying and dividing expressions (A3)
 Factorising expressions (A3)
 Simplifying fractions (NP7)
 Rearranging formulae (A5)

What will I learn about in this unit?

Rules of indices: multiplication, division and exponentiation
 Multiplying multiple brackets
 Factorising quadratics
 Simplifying algebraic fractions
 Rearranging more complex formulae

Where does this lead?

Quadratic graphs and equations (A12, A14)
 Working with all types of non-linear functions (A15)
 Operating with algebraic fractions (A17)
 Algebraic proof by deduction (A17)
 A-Level mathematics

Key words and symbols: what I need to say and write accurately

Word	Explanation	
polynomial	an expression containing only numbers and non-negative powers of x . e.g. $12x + 7$, $12 + 56x - x^2$, $12 + 56x - x^2 + 11x^3$.	
binomial	an expression with two terms. e.g. $x - 1$, $5x + 6$, $12x^2 + 7x$.	
\equiv	'is identical to'. Used to show an identity – when two expressions are identical for every value of x , perhaps just written in a different way. e.g. $x^2 + 5x + 6 \equiv (x + 3)(x + 2)$ or $5x - 3x \equiv 2x$	
Types of polynomial	General expanded form	Example (expanded and factorised)
Constant, x^0 , no brackets	a	5
Linear, x^1 , up to one bracket	$ax + b$	$4x + 10 \equiv 2(2x + 5)$
Quadratic, x^2 , up to two brackets	$ax^2 + bx + c$	$2x^2 + 7x + 3 \equiv (2x + 1)(x + 3)$
Cubic, x^3 , up to three brackets	$ax^3 + bx^2 + cx + d$	$x^3 + 3x^2 - 6x - 8 \equiv (x + 1)(x - 2)(x + 4)$

Fingertip facts: what I need to learn by heart

The index laws

- When we multiply powers with the same base, we can add their exponents. $x^7 \cdot x^3 = x^{10}$
- When we divide powers with the same base, we can subtract their exponents. $\frac{x^7}{x^3} = x^4$
- When we find a power of a power, we can multiply the exponents together. $(x^2)^3 = x^6$

Factorising a quadratic, $ax^2 + bx + c$

Look for two numbers whose sum is b and whose product is ac .

e.g. $x^2 - 4x - 12 \equiv (x - 6)(x + 2)$

e.g. $2x^2 - x - 10 \equiv (2x - 5)(x + 2)$

x	x	
x	x ²	
		-12
	-6x	-12
	-6	-6x
		-12

Sum of these coefficients is -4.
Product is -12.

x		
	2x ²	
		-10
	2x ²	4x
	-5x	-10
	-5	-5x
		-10

Sum of these coefficients is -1.
Product is -20.

Difference of two squares e.g. $x^2 - 9 \equiv (x - 3)(x + 3)$ or $16x^2 - 49 \equiv (4x - 7)(4x + 7)$

My mathematical journey

What do I need to remember from before?

Substitution (A5)

Linear and quadratic graphs (A6)

Factorising quadratics (A11)

What will I learn about in this unit?

Solving quadratic equations using graphs, factorising, the quadratic formula and completing the square

Sketching graphs of quadratics using their key features

Where does this lead?

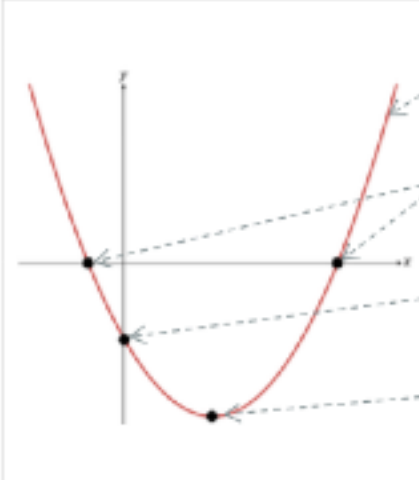
Quadratic sequences (A13)

Advanced quadratic equations (A14)

Quadratic inequalities (A14)

A-Level Mathematics

Key words and symbols: what I need to say and write accurately

	Word	Explanation
	parabola	The shape of a quadratic graph.
	roots	The points on the graph of $y = ax^2 + bx + c$ where $y = 0$. These are the solutions to the equation $ax^2 + bx + c = 0$ and are the points where the graph crosses the x -axis.
	y-intercept	Where a graph crosses the y -axis. This is the point where $x = 0$, so on a quadratic graph with equation $y = ax^2 + bx + c$, its value is c .
	vertex/ turning point	The minimum or maximum point on a quadratic graph. Its x -coordinate is the midpoint of the roots. The vertical line through the vertex is the graph's line of symmetry.

Fingertip facts: what I need to learn by heart

The quadratic formula

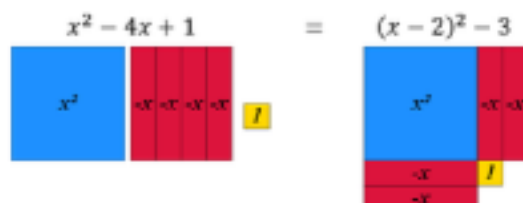
Every quadratic equation of the form $ax^2 + bx + c = 0$ can be solved using the quadratic formula:

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

Completing the square

Every quadratic expression of the form $x^2 + bx + c$ can be written as an adjustment to a perfect square, $(x + p)^2 + q$.

e.g. $x^2 - 4x + 1$ is 3 less than the perfect square $(x - 2)^2$.

$$x^2 - 4x + 1 = (x - 2)^2 - 3$$


Deciding how to solve a quadratic

If the quadratic can be factorised, do so to solve.

If the quadratic cannot be factorised, you should either complete the square (which is easier when $a = 1$) or use the quadratic formula.

My mathematical journey

What do I need to remember from before?

Measuring length, area and volume (NP1)

Area of shapes (GM3)

Types of solids and their nets (GM7)

What will I learn about in this unit?

Surface area and volume of cubes and cuboids, prisms, cylinders, spheres, pyramids, cones and frustums

Converting between square and cubic units

Surface area and volume of similar solids

Where does this lead?

Pythagoras and trigonometry in 3D (GM9)








Solving geometric problems, including density and pressure (GM11)

A Level Mathematics

Construction, engineering and architecture

Fingertip facts: what I need to learn by heart

The concepts of surface area and volume are the same for all solids, but some have specific formulae to learn.

Solid	Surface area (sum of the area of all the faces)	Volume (space inside the solid)
Cuboid 		length \times width \times height $= lwh$
Prism 		area of cross-section \times length
Cylinder 	area of two circles + curved surface area $= 2\pi r^2 + 2\pi rh$ $= 2\pi r^2 + \pi dh$	area of cross-section \times length $= \pi r^2 h$
Sphere 	curved surface area $= 4\pi r^2$	$\frac{4}{3}\pi r^3$
Pyramid 		$\frac{1}{3}$ volume of a prism with same base and height
Cone 	base + curved surface area $= \pi r^2 + \pi rl$	$\frac{1}{3}$ volume of a cylinder with same base and height $= \frac{1}{3}\pi r^2 h$
Frustum 	curved surface area (large cone – small cone) + two circles $= \pi RL - \pi rl + \pi R^2 + \pi r^2$	volume of large cone – volume of small cone $= \frac{1}{3}\pi R^2 H - \frac{1}{3}\pi r^2 h$

Unit conversions

When converting between square units, we square the length conversion factor.

e.g. $1 \text{ m}^2 = 100^2 \text{ cm}^2 = 10\,000 \text{ cm}^2$

When converting between cubic units, we cube the length conversion factor.

e.g. $1 \text{ m}^3 = 100^3 \text{ cm}^3 = 1\,000\,000 \text{ cm}^3$

Similar solids

The relationship between scale factors of length (1D), area (2D) and volume (3D):



My mathematical journey

What do I need to remember from before?

Substitution (A5)

Linear sequences and their n^{th} term (A7)

Non-linear sequences (A7)

Quadratic expressions (A11)

What will I learn about in this unit?

The n^{th} term of quadratic and geometric sequences

Recurrence relations

Solving problems with sequences

Where does this lead?

A-Level Maths (advanced work with arithmetic and geometric progressions)

Exponential growth and decay (NP16)

Key words and symbols: what I need to say and write accurately

Word/Symbol	Explanation
u_n	The n^{th} term of a sequence
linear sequence	A sequence where the difference between terms is constant (doesn't change). e.g. 5, 7, 9, 11, ... (the difference is 2) or 10, 7, 4, 1, ... (the difference is -3).
quadratic sequence	A sequence where the differences between terms form a linear sequence. e.g. 1, 4, 9, 16, 25, ... (the differences are 3, 5, 7, 9, ..., which is itself a linear sequence).
geometric sequence	A sequence where there is a constant multiplier between terms. e.g. 1, 2, 4, 8, 16, ... (each term is multiplied by 2 to get the next)
Fibonacci-style sequence	A sequence where each term is the sum of the previous two. e.g. 1, 4, 5, 9, 14, 23, ...
recurrence relation	A formula that defines a term or terms of a sequence in relation to a previous term or terms. e.g. $u_{n+1} = 2u_n$; $u_1 = 5$ mean that each term is double the previous and you start at 5

Fingertip facts: what I need to learn by heart

The sequence of square numbers: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, ...

The sequence of cube numbers: 1, 8, 27, 64, 125, 216, 343, 512, 729, 1000, ...

The triangular (or triangle) numbers: 1, 3, 6, 10, 15, 21, 28, 36, 45, 55, ...

The Fibonacci sequence: 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, ...

The n^{th} term of a quadratic sequence is made up of an^2 (where a is half the second difference) and $bn + c$ which is a linear sequence. To find this n^{th} term, subtract an^2 from the terms in the quadratic sequence to get a linear sequence, then find the n^{th} term of what you get.

e.g. For the sequence 6, 19, 38, 63, 94, ... we get $3n^2 + 4n - 1$ like this:

Position, n	1	2	3	4	5	n
Sequence, u_n	6	19	38	63	94	$3n^2 + 4n - 1$
an^2 ($a = 3$)	3	12	27	48	75	$3n^2$
Difference	3	7	11	15	19	$4n - 1$

GM9 Knowledge Organiser – not released yet