



# Mathematics Curriculum Design and Overview

	Band B	Band A
Year 7	<ul style="list-style-type: none"> <li>• Multiply and divide numbers with up to three decimal places by 10, 100, and 1000</li> <li>• Use long division to divide numbers up to four digits by a two-digit number</li> <li>• Use simple formulae expressed in words</li> <li>• Generate and describe linear number sequences</li> <li>• Use simple ratio to compare quantities</li> <li>• Write a fraction in its lowest terms by cancelling common factors</li> <li>• Add and subtract fractions and mixed numbers with different denominators</li> <li>• Multiply pairs of fractions in simple cases</li> <li>• Find percentages of quantities</li> <li>• Solve missing angle problems involving triangles, quadrilaterals, angles at a point and angles on a straight line</li> <li>• Calculate the volume of cubes and cuboids</li> <li>• Use coordinates in all four quadrants</li> <li>• Calculate and interpret the mean as an average of a set of discrete data</li> </ul>	<ul style="list-style-type: none"> <li>• Use positive integer powers and associated real roots</li> <li>• Apply the four operations with decimal numbers</li> <li>• Write a quantity as a fraction or percentage of another</li> <li>• Use multiplicative reasoning to interpret percentage change</li> <li>• Add, subtract, multiply and divide with fractions and mixed numbers</li> <li>• Check calculations using approximation, estimation or inverse operations</li> <li>• Simplify and manipulate expressions by collecting like terms</li> <li>• Simplify and manipulate expressions by multiplying a single term over a bracket</li> <li>• Substitute numbers into formulae</li> <li>• Solve linear equations in one unknown</li> <li>• Understand and use lines parallel to the axes, <math>y = x</math> and <math>y = -x</math></li> <li>• Calculate surface area of cubes and cuboids</li> <li>• Understand and use geometric notation for labelling angles, lengths, equal lengths and parallel lines</li> </ul>
Year 8	<ul style="list-style-type: none"> <li>• Use positive integer powers and associated real roots</li> <li>• Apply the four operations with decimal numbers</li> <li>• Write a quantity as a fraction or percentage of another</li> <li>• Use multiplicative reasoning to interpret percentage change</li> <li>• Add, subtract, multiply and divide with fractions and mixed numbers</li> <li>• Check calculations using approximation, estimation or inverse operations</li> <li>• Simplify and manipulate expressions by collecting like terms</li> <li>• Simplify and manipulate expressions by multiplying a single term over a bracket</li> <li>• Substitute numbers into formulae</li> <li>• Solve linear equations in one unknown</li> <li>• Understand and use lines parallel to the axes, <math>y = x</math> and <math>y = -x</math></li> <li>• Calculate surface area of cubes and cuboids</li> <li>• Understand and use geometric notation for labelling angles, lengths, equal lengths and parallel lines</li> </ul>	<ul style="list-style-type: none"> <li>• Apply the four operations with negative numbers</li> <li>• Convert numbers into standard form and vice versa</li> <li>• Apply the multiplication, division and power laws of indices</li> <li>• Convert between terminating decimals and fractions</li> <li>• Find a relevant multiplier when solving problems involving proportion</li> <li>• Solve problems involving percentage change, including original value problems</li> <li>• Factorise an expression by taking out common factors</li> <li>• Change the subject of a formula when two steps are required</li> <li>• Find and use the <math>n</math>th term for a linear sequence</li> <li>• Solve linear equations with unknowns on both sides</li> <li>• Plot and interpret graphs of linear functions</li> <li>• Apply the formulae for circumference and area of a circle</li> <li>• Calculate theoretical probabilities for single events</li> </ul>

Year 9	<ul style="list-style-type: none"> <li>• Apply the four operations with negative numbers</li> <li>• Convert numbers into standard form and vice versa</li> <li>• Apply the multiplication, division and power laws of indices</li> <li>• Convert between terminating decimals and fractions</li> <li>• Find a relevant multiplier when solving problems involving proportion</li> <li>• Solve problems involving percentage change, including original value problems</li> <li>• Factorise an expression by taking out common factors</li> <li>• Change the subject of a formula when two steps are required</li> <li>• Find and use the nth term for a linear sequence</li> <li>• Solve linear equations with unknowns on both sides</li> <li>• Plot and interpret graphs of linear functions</li> <li>• Apply the formulae for circumference and area of a circle</li> <li>• Calculate theoretical probabilities for single events</li> </ul>	<ul style="list-style-type: none"> <li>• Calculate with roots and integer indices</li> <li>• Manipulate algebraic expressions by expanding the product of two binomials</li> <li>• Manipulate algebraic expressions by factorising a quadratic expression of the form <math>x^2 + bx + c</math></li> <li>• Understand and use the gradient of a straight line to solve problems</li> <li>• Solve two linear simultaneous equations algebraically and graphically</li> <li>• Plot and interpret graphs of quadratic functions</li> <li>• Change freely between compound units</li> <li>• Use ruler and compass methods to construct the perpendicular bisector of a line segment and to bisect an angle</li> <li>• Solve problems involving similar shapes</li> <li>• Calculate exactly with multiples of <math>\pi</math></li> <li>• Apply Pythagoras' Theorem in two dimensions</li> <li>• Use geometrical reasoning to construct simple proofs</li> <li>• Use tree diagrams to list outcomes</li> </ul>
	Foundation	Higher
Year 10	<ul style="list-style-type: none"> <li>• Calculate with roots and integer indices</li> <li>• Manipulate algebraic expressions by expanding the product of two binomials</li> <li>• Manipulate algebraic expressions by factorising a quadratic expression of the form <math>x^2 + bx + c</math></li> <li>• Understand and use the gradient of a straight line to solve problems</li> <li>• Solve two linear simultaneous equations algebraically and graphically</li> <li>• Plot and interpret graphs of quadratic functions</li> <li>• Change freely between compound units</li> <li>• Use ruler and compass methods to construct the perpendicular bisector of a line segment and to bisect an angle</li> <li>• Solve problems involving similar shapes</li> <li>• Calculate exactly with multiples of <math>\pi</math></li> <li>• Apply Pythagoras' Theorem in two dimensions</li> <li>• Use geometrical reasoning to construct simple proofs</li> <li>• Use tree diagrams to list outcomes</li> </ul>	<ul style="list-style-type: none"> <li>• Manipulate fractional indices</li> <li>• Solve problems involving direct and inverse proportion</li> <li>• Convert between recurring decimals and fractions</li> <li>• Manipulate algebraic expressions by factorising a quadratic expression of the form <math>ax^2 + bx + c</math></li> <li>• Solve quadratic equations by factorising</li> <li>• Link graphs of quadratic functions to related equations</li> <li>• Interpret a gradient as a rate of change</li> <li>• Recognise and use the equation of a circle with centre at the origin</li> <li>• Apply right-angled trigonometry in two dimensions</li> <li>• Calculate volumes of spheres, cones and pyramids</li> <li>• Understand and use vectors</li> <li>• Analyse data through measures of central tendency, including quartiles</li> </ul>

Year 11	<ul style="list-style-type: none"> <li>• Apply right-angled trigonometry in two dimensions</li> <li>• Manipulate negative indices</li> <li>• Solve simultaneous equations</li> <li>• Problems with shapes involving quadratics</li> <li>• Know and use the graphs of inverse and direct proportion</li> <li>• Recognise and describe geometric sequences</li> <li>• Calculate volumes of spheres, cones and pyramids</li> <li>• Solve quadratics through factorising</li> <li>• Link graphs of quadratic functions to related equations</li> <li>• Understand and use vectors</li> <li>• Complete constructions</li> <li>• Understand and use Sampling methods</li> </ul>	<ul style="list-style-type: none"> <li>• Solve equations using iterative methods</li> <li>• Simplify surds, including rationalising the denominator of a surd expression</li> <li>• Manipulate quadratic expressions by completing the square</li> <li>• Deduce roots and turning points of quadratic functions</li> <li>• Understand the concept of an instantaneous rate of change</li> <li>• Sketch translations and reflections of given functions</li> <li>• Solve quadratic inequalities in one variable</li> <li>• Use the sine and cosine rules to solve problems</li> <li>• Complete Constructions</li> </ul>
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