

## Curriculum Map Year 9: Mathematics AQA

| Final GCSE Assessment                        | Marks |
|----------------------------------------------|-------|
| Written examination (Paper 1) Non-calculator | 80    |
| Written examination (Paper 2)                | 80    |
| Written examination (Paper 3)                | 80    |

|                    | Topic                                                                                                         | Key Knowledge<br><i>What will students know by the end of this topic?</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Key Skills<br><i>What skills will students have developed by the end of this topic?</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Assessment Opportunities<br><i>How will student progress be measured?<br/>What are the key assessment pieces?</i> |
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| <b>Half Term 1</b> | Number Review<br><br>Percentages<br><br>Ratio and Proportion<br><br>Solving Linear Equations and Inequalities | Students will learn: <ul style="list-style-type: none"> <li>How to order integers, decimals and fractions and use the symbols <math>=</math>, <math>\neq</math>, <math>&lt;</math>, <math>&gt;</math>, <math>\leq</math>, <math>\geq</math></li> <li>The four operations with integers, decimals, fractions and mixed numbers, both positive and negative</li> <li>The conventional priority of operations, including brackets, powers, roots and reciprocals</li> <li>The vocabulary of primes, factors, multiples, HCF, LCM and prime factorisation</li> <li>Systematic listing strategies and the product rule for counting</li> <li>Positive integer powers and their roots, and how to calculate with integer indices</li> <li>How to calculate exactly with fractions and multiples of <math>\pi</math></li> <li>The link between terminating decimals and fractions, and between recurring decimals and fractions (Higher)</li> <li>Percentage as "number of parts per hundred"</li> <li>How fractions, decimals and percentages act as operators and multipliers</li> <li>Percentage change, original value (reverse percentage) and simple interest problems</li> <li>Repeated proportional change, including compound interest, growth and decay</li> <li>Ratio notation and how to write a ratio in its simplest form</li> <li>The difference between part : part and part : whole ratios</li> <li>That a multiplicative relationship between two quantities can be written as a ratio or a fraction</li> <li>Proportion as equality of ratios</li> </ul> | Students will be able to: <ul style="list-style-type: none"> <li>Apply the four operations to fractions and mixed numbers with and without a calculator</li> <li>Write a number as a product of prime factors in index form and use this to find the HCF and LCM</li> <li>List outcomes systematically and use the rule that x ways followed by y ways gives xy ways</li> <li>Calculate with roots and integer indices, and estimate powers and roots of any positive number (Higher)</li> <li>Express one quantity as a fraction of another</li> <li>Convert a recurring decimal to a fraction using a formal algebraic method (Higher)</li> <li>Find a percentage of a quantity and express one quantity as a percentage of another</li> <li>Increase and decrease by a percentage using a multiplier, including percentages over 100%</li> <li>Work backwards to find an original value</li> <li>Solve simple and compound interest problems</li> <li>Use a multiplier and a power to solve growth and decay problems</li> <li>Simplify ratios, including those with different units</li> <li>Divide a quantity into a given ratio, including when given one part or the difference between parts</li> <li>Convert between ratios and fractions and solve problems involving both</li> <li>Apply ratio to real contexts such as recipes, mixing, conversion and best buy problems</li> <li>Solve linear equations with the unknown on one or both sides, including brackets and fractions</li> </ul> | Topic Reviews<br>Assessment each half term<br>Weekly Sparx maths homework                                         |

|                    | Topic                                                                                                    | Key Knowledge<br><i>What will students know by the end of this topic?</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Key Skills<br><i>What skills will students have developed by the end of this topic?</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Assessment Opportunities<br><i>How will student progress be measured?<br/>What are the key assessment pieces?</i> |
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|                    |                                                                                                          | <ul style="list-style-type: none"> <li>How to solve linear equations using inverse operations or by balancing</li> <li>How to form an equation from a written or geometric context</li> <li>Inequality notation and the number line conventions for strict and inclusive inequalities</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>Set up and solve linear equations from contexts, including ratio and geometry problems, and interpret the solution</li> <li>Solve linear inequalities in one variable and show the solution set on a number line</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                   |
| <b>Half Term 2</b> | Algebraic Manipulation<br><br>Rearranging Formulae<br><br>Pythagorean Theorem<br><br>Standard Index Form | Students will learn: <ul style="list-style-type: none"> <li>Algebraic notation and the vocabulary of expressions, equations, formulae, identities, inequalities, terms and factors</li> <li>How to substitute into formulae and expressions, including scientific formulae</li> <li>The laws of indices applied to algebraic terms</li> <li>How to expand and factorise expressions, including quadratics</li> <li>Standard mathematical formulae and formulae from other subjects, in words and in symbols</li> <li>That rearranging a formula uses the same inverse operations as solving an equation</li> <li>Pythagoras' theorem, <math>a^2 + b^2 = c^2</math>, and that c is the hypotenuse</li> <li>When Pythagoras' theorem can be applied</li> <li>The form <math>A \times 10^n</math>, where <math>1 \leq A &lt; 10</math> and n is an integer</li> <li>How to interpret standard form on a calculator display</li> </ul> | Students will be able to: <ul style="list-style-type: none"> <li>Simplify expressions by collecting like terms and using the laws of indices</li> <li>Expand a single bracket and the product of two binomials</li> <li>Factorise by taking out common factors</li> <li>Factorise quadratics of the form <math>x^2 + bx + c</math>, including the difference of two squares</li> <li>Expand products of three binomials and factorise <math>ax^2 + bx + c</math> (Higher)</li> <li>Substitute into and use given formulae</li> <li>Change the subject of a formula, including formulae involving powers, roots and brackets</li> <li>Identify the hypotenuse and find any missing side of a right-angled triangle</li> <li>Use Pythagoras' theorem to solve problems in 2D, including the distance between two coordinates</li> <li>Apply Pythagoras' theorem in 3D problems (Higher)</li> <li>Convert between ordinary numbers and standard form for large and small numbers</li> <li>Order numbers written in standard form</li> <li>Multiply, divide, add and subtract in standard form, with and without a calculator</li> <li>Solve problems in context involving standard form</li> </ul> | Topic Reviews<br>Assessment each half term<br>Weekly Sparx maths homework                                         |
| <b>Half Term 3</b> | Angles<br><br>Area, Perimeter, Volume and Surface Area<br><br>Estimation, Rounds and Bounds              | Students will learn: <ul style="list-style-type: none"> <li>Conventional terms and labelling for points, lines, angles and polygons</li> <li>Angles at a point, on a straight line and vertically opposite angles</li> <li>Alternate and corresponding angles on parallel lines, using the correct terminology</li> <li>The angle sum of a triangle and of a quadrilateral</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Students will be able to: <ul style="list-style-type: none"> <li>Calculate missing angles, giving geometric reasons</li> <li>Use parallel line angle facts in multi-step problems</li> <li>Derive and use the angle sum of any polygon and the interior and exterior angles of regular polygons</li> <li>Identify, name and classify quadrilaterals from their properties</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Topic Reviews<br>Assessment each half term<br>Weekly Sparx maths homework                                         |

|                    | Topic                                                     | Key Knowledge<br><i>What will students know by the end of this topic?</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Key Skills<br><i>What skills will students have developed by the end of this topic?</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Assessment Opportunities<br><i>How will student progress be measured?<br/>What are the key assessment pieces?</i> |
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|                    |                                                           | <ul style="list-style-type: none"> <li>The properties and definitions of special quadrilaterals and triangles</li> <li>The formulae for the area of a rectangle, triangle, parallelogram and trapezium</li> <li>The formulae for the circumference and area of a circle</li> <li>That the volume of a prism is the area of the cross section multiplied by the length</li> <li>How to round to decimal places and significant figures</li> <li>How to estimate answers and check calculations using approximation</li> <li>That a rounded or truncated measurement lies within an error interval</li> <li>Upper and lower bounds and how they combine in calculations (Higher)</li> </ul>                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>Calculate the perimeter and area of 2D shapes, including circles and compound shapes</li> <li>Work backwards from a circumference or area to find a radius or diameter</li> <li>Calculate the volume and surface area of cuboids, prisms and cylinders</li> <li>Give answers in terms of <math>\pi</math> where required and solve problems in context</li> <li>Round to a given number of decimal places or significant figures, and to an appropriate degree of accuracy in context</li> <li>Estimate the value of a calculation by rounding to 1 significant figure</li> <li>Write error intervals using inequality notation for rounding and truncation</li> <li>Find the maximum or minimum value of a calculation using bounds (Higher)</li> </ul>                                                                                                                                                                           |                                                                                                                   |
| <b>Half Term 4</b> | Sequences<br><br>Straight Lines<br><br>Basic Trigonometry | <p>Students will learn:</p> <ul style="list-style-type: none"> <li>How sequences are generated from term-to-term and position-to-term rules</li> <li>Triangular, square and cube numbers, arithmetic, Fibonacci-type and simple geometric sequences</li> <li>How the common difference is used to form the <math>n</math>th term of a linear sequence</li> <li>Coordinates in all four quadrants</li> <li>That <math>y = mx + c</math> is a straight line with gradient <math>m</math> and <math>y</math>-intercept <math>(0, c)</math></li> <li>That parallel lines have equal gradients</li> <li>That perpendicular gradients are negative reciprocals of each other (Higher)</li> <li>The trigonometric ratios <math>\sin \theta</math>, <math>\cos \theta</math> and <math>\tan \theta</math> in terms of opposite, adjacent and hypotenuse</li> <li>How to label the sides of a right-angled triangle relative to a given angle</li> </ul> | <p>Students will be able to:</p> <ul style="list-style-type: none"> <li>Generate terms of a sequence from a rule or from a pattern of diagrams</li> <li>Find the <math>n</math>th term of a linear sequence</li> <li>Use the <math>n</math>th term to decide whether a number is a term in the sequence</li> <li>Recognise and continue special sequences, including other sequences defined in the question (Higher)</li> <li>Plot straight-line graphs from a table of values</li> <li>Find the gradient and intercepts of a line from its graph and from its equation</li> <li>Find the equation of a line through two points, or through one point with a given gradient</li> <li>Find the midpoint of a line segment</li> <li>Find the equation of a line perpendicular to a given line (Higher)</li> <li>Choose the correct ratio to find a missing side in a right-angled triangle</li> <li>Use inverse trigonometric functions to find a missing angle</li> </ul> | <p>Topic Reviews</p> <p>Assessment each half term</p> <p>Weekly Sparx maths homework</p>                          |

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|                    |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>Solve problems in 2D involving right-angled triangles, including angles of elevation and depression</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                   |
| <b>Half Term 5</b> | Quadratic Graphs<br><br>Transformations | Students will learn: <ul style="list-style-type: none"> <li>The shape and line of symmetry of a quadratic graph</li> <li>How to recognise a quadratic graph among other linear and non-linear graphs</li> <li>Line and rotational symmetry of 2D shapes</li> <li>Translations described by column vectors, and reflections, rotations and enlargements</li> <li>That translations, rotations and reflections preserve length and angle, so the image is congruent</li> <li>Negative scale factors, combined transformations and invariance (Higher)</li> </ul> | Students will be able to: <ul style="list-style-type: none"> <li>Complete a table of values for a quadratic function, including negative values of x</li> <li>Plot a quadratic graph with a smooth curve</li> <li>Read values from a quadratic graph and interpret it in context</li> <li>Identify lines of symmetry and the order of rotational symmetry</li> <li>Perform and fully describe translations, reflections, rotations and enlargements, including fractional scale factors</li> <li>Find a centre of rotation and a centre of enlargement</li> <li>Enlarge by a negative scale factor and describe a combination of transformations as a single transformation (Higher)</li> </ul> | Topic Reviews<br>Assessment each half term<br>Weekly Sparx maths homework                                         |
| <b>Half Term 6</b> | Statistics                              | Students will learn: <ul style="list-style-type: none"> <li>That a sample may or may not represent a population, and why</li> <li>Primary and secondary data, and discrete and continuous data</li> <li>Measures of average (mean, median, mode, modal class) and spread (range), including outliers</li> <li>Quartiles and the interquartile range (Higher)</li> </ul>                                                                                                                                                                                        | Students will be able to: <ul style="list-style-type: none"> <li>Find the mean, median, mode and range from lists and frequency tables</li> <li>Calculate an estimate of the mean from grouped data and explain why it is an estimate</li> <li>Identify the modal class and the class containing the median</li> <li>Choose an appropriate average and compare distributions using an average and a measure of spread</li> </ul>                                                                                                                                                                                                                                                                | Topic Reviews<br>Assessment each half term<br>Weekly Sparx maths homework                                         |