

# YEAR 10 COURSE GUIDE

	<b>Selected Success Criteria, from this year's course</b>	
<b>ALGEBRA 1</b>	<ul style="list-style-type: none"> <li>• Expand the product of three binomials (three brackets)</li> <li>• Create a mathematical argument to prove an identity</li> <li>• Change the subject of a formula that involves powers or roots</li> <li>• Change the subject of a formula when the required subject appears twice</li> </ul>	
<b>TRIGONOMETRY 1</b>	<ul style="list-style-type: none"> <li>• Use trigonometry to find missing sides in right-angled triangles</li> <li>• Use trigonometry to find missing angles in right-angled triangles</li> </ul>	
<b>POWERS &amp; ROOTS</b>	<ul style="list-style-type: none"> <li>• Estimate squares, cubes and roots of integers and decimals</li> <li>• Evaluate expressions involving fractional powers</li> <li>• Practise GCSE-style problems involving standard form in context</li> <li>• Add, subtract, multiply, divide, simplify and expand brackets with surds</li> <li>• Rationalise a fraction where the denominator is a single surd term e.g. <math>2\sqrt{7}</math></li> <li>• Apply Pythagoras' theorem to problems involving surds</li> </ul>	
<b>LINEAR INEQUALITIES</b>	<ul style="list-style-type: none"> <li>• Understand the situations in which an inequality is reversed</li> <li>• Solve linear inequalities in situations where an inequality is reversed</li> <li>• Find the set of integer solutions to an inequality, including using set notation</li> <li>• Solve problems by constructing and solving linear inequalities</li> <li>• Solve a simple three-part inequality e.g. <math>10 &lt; 3x + 9 &lt; 40</math></li> </ul>	
<b>TRANSFORMATION</b>	<ul style="list-style-type: none"> <li>• Identify and describe a single transformation</li> <li>• Know which transformations produce congruent and similar images</li> <li>• Use and describe an enlargement by a negative scale factor</li> <li>• Work with combinations of transformations</li> <li>• Identify points/lines that are invariant under a given transformation</li> <li>• Solve practical problems involving length, area and volume in similar figures</li> </ul>	
<b>QUADRATICS 1</b>	<ul style="list-style-type: none"> <li>• Identify roots, intercepts and turning points of quadratics from a graph</li> <li>• Find approximate solutions to quadratic equations using a graph</li> <li>• Factorise more complex quadratics e.g. <math>2x^2 + 5x + 3</math> or <math>4x^2 - 25</math></li> <li>• Solve quadratic equations by factorising, including rearranging first</li> <li>• Sketch a graph of a quadratic function, using factorisation</li> <li>• Solve problems in context by forming and solving a quadratic equation</li> <li>• Simplify an algebraic fraction that involves factorisation (linear and quadratic)</li> </ul>	
<b>PROPORTION 1</b>	<ul style="list-style-type: none"> <li>• Recognise tables, graphs and formulae showing direct and inverse proportion</li> <li>• Construct/use formulae for proportion involving powers/roots e.g. <math>a = k\sqrt{b}</math></li> <li>• Solve more complex problems involving the combining of ratios</li> <li>• Solve complex problems combining fractions, percentages and/or ratio</li> <li>• Express ratios in the form 1:n or m:1 and use this to compare proportions</li> <li>• Relate ratios to formulae e.g. <math>2y=3x</math>, what is x:y?</li> </ul>	
<b>DATA 1</b>	<ul style="list-style-type: none"> <li>• Understand the lack of reliability of extrapolating from a scatter diagram</li> <li>• Understand that correlation does not necessarily indicate causation</li> <li>• Know the limitations of sampling and understand a simple random sample</li> <li>• Find the quartiles and construct box plots for simple data sets</li> <li>• Calculate and interpret the interquartile range</li> <li>• Compare data using box plots, and using data given in more than one form</li> </ul>	
<b>ALGEBRA 2</b>	<ul style="list-style-type: none"> <li>• Solve problems in context by creating two linear simultaneous equations</li> <li>• Work with shaded regions showing inequalities in two variables</li> <li>• Find the set of integer coordinates that are solutions to a set of inequalities</li> <li>• Use functions defined using a function machine, expression or equation</li> </ul>	

<b>GEOMETRIC REASONING</b>	<ul style="list-style-type: none"> <li>• Prove that two given triangles are congruent (SSS, SAS, RHS, ASA)</li> <li>• Know and use the Circle Theorems, including knowing suitable wording</li> <li>• Create a geometrical proof, including applying circle theorems</li> </ul>	
<b>DATA 2</b>	<ul style="list-style-type: none"> <li>• Construct a cumulative frequency curve and use it to estimate values</li> <li>• Use a CF curve to estimate median, quartiles and IQR and construct a box plot</li> <li>• Construct a histogram for grouped data, understanding its use</li> </ul>	
<b>NUMBER</b>	<ul style="list-style-type: none"> <li>• Solve problems involving HCF or LCM, incl. numbers given in prime factor form</li> <li>• Identify bounds and error intervals for both discrete and continuous quantities</li> <li>• Truncate a decimal number and write an error interval for a truncated value</li> <li>• Solve simple problems involving one truncated quantity</li> <li>• Solve a bounds problem involving more than one rounded measurement</li> <li>• Convert a recurring decimal to a fraction, checking the result</li> </ul>	
<b>QUADRATICS 2</b>	<ul style="list-style-type: none"> <li>• Complete the square and use this to identify the turning point (vertex), the minimum value and the value of x for which it occurs, the line of symmetry</li> <li>• Solve a quadratic equation by completing the square (a=1)</li> <li>• Know and apply the Quadratic Formula to solve quadratic equations</li> <li>• Solve equations involving fractions that can be rearranged into <math>ax^2 + bx + c = 0</math></li> <li>• Continue to solve a range of problems that generate a quadratic equation</li> </ul>	
<b>PROPORTION 2</b>	<ul style="list-style-type: none"> <li>• Solve problems involving speed, density and pressure; convert units of speed</li> <li>• Solve problems involving rates of pay, population density and unit pricing</li> <li>• Find the percentage of a given increase, decrease, profit or loss</li> <li>• Compare investments earning simple interest and compound interest</li> <li>• Determine the number of increases or decreases by a percentage needed</li> <li>• Calculate the original quantity, given the result of a single fractional change</li> <li>• Find the result of a repeated fractional increase or decrease</li> </ul>	
<b>PROBABILITY</b>	<ul style="list-style-type: none"> <li>• Apply the 'product rule for counting' to a range of contexts</li> <li>• Use the addition law ('OR') and multiplication law ('AND')</li> <li>• Use a probability tree diagram to solve a range of problems</li> <li>• Use two-way tables and Venn diagrams in GCSE-style problems</li> </ul>	
<b>LOCI &amp; VECTORS</b>	<ul style="list-style-type: none"> <li>• Solve more complex loci problems involving regions with multiple criteria</li> <li>• Work with column vectors shown as 'arrows' on grids</li> <li>• Add and subtract column vectors and multiply a column vector by a scalar</li> <li>• Work with 'letter' vectors on a grid and solve simple problems</li> </ul>	
<b>TRIGONOMETRY 2</b>	<ul style="list-style-type: none"> <li>• Know and use exact values for trigonometric functions e.g. <math>\sin 30 = \frac{1}{2}</math></li> <li>• Find a missing side or angle using the Sine Rule or Cosine Rule</li> </ul>	
<b>SEQUENCES</b>	<ul style="list-style-type: none"> <li>• Find the nth term of a quadratic sequence</li> <li>• Recognise and use simple geometric sequences and those involving surds</li> <li>• Find a formula for the nth term of a simple geometric sequence</li> <li>• Find the nth term of a sequence of fractions</li> <li>• Decide whether a sequence is linear, arithmetic, geometric, quadratic or other</li> </ul>	
<b>GRAPHS</b>	<ul style="list-style-type: none"> <li>• Use gradients of perpendicular lines, incl. showing lines are perpendicular</li> <li>• Understand and use the equation of a circle</li> <li>• Find the equation of a tangent to a circle at a given point</li> <li>• Calculate an estimate for the area under a curve, including in context</li> <li>• Find the acceleration and distance from a speed-time graph</li> </ul>	
<b>SOLIDS</b>	<ul style="list-style-type: none"> <li>• Find the volume and surface area of spheres, cones and pyramids</li> <li>• Find the volume or surface area of a composite solid, including in terms of <math>\pi</math></li> <li>• Continue to solve practical problems involving volume and surface area</li> </ul>	