

## YEAR 10 COURSE GUIDE

	<b>Selected Success Criteria, from this year's course</b>	
<b>BRACKETS</b>	<ul style="list-style-type: none"> <li>• Expand and simplify a 'double' bracket e.g. <math>(2k + 1)(4k + 5)</math> or <math>(x - 2y)^2</math></li> <li>• Expand when more than two terms appear in a bracket e.g. <math>(x + 3)(x^2 + 3x - 5)</math></li> <li>• Continue to use brackets in simple contexts e.g. the area of a rectangle</li> <li>• Factorise a quadratic expression e.g. <math>x^2 - 7x - 18</math>, <math>x^2 - 25</math></li> </ul>	
<b>NUMBER</b>	<ul style="list-style-type: none"> <li>• Evaluate complex expressions using positive and negative powers, and roots</li> <li>• Use a calculator to evaluate numerical expressions involving powers and roots</li> <li>• Work with numbers in standard form in GCSE-standard questions</li> <li>• Solve problems where numbers are given in prime factor form</li> </ul>	
<b>LOCI</b>	<ul style="list-style-type: none"> <li>• Construct an angle bisector and perpendicular bisector of a line segment</li> <li>• Construct a perpendicular at a point on a line, or from a point to a line</li> <li>• Construct the locus of points a fixed distance from a point, and from a line</li> <li>• Construct the locus of points equidistant from two lines, and from two points</li> <li>• Construct a triangle with three given sides (SSS) or an angle of <math>60^\circ</math> or <math>30^\circ</math></li> <li>• Choose techniques to construct 2D shapes; e.g. a rhombus</li> </ul>	
<b>EQUATIONS 1</b>	<ul style="list-style-type: none"> <li>• Solve linear equations with the unknown on both sides</li> <li>• Form and solve linear equations to solve increasingly complex problems</li> <li>• Use a graph to find the approximate solution of a linear equation</li> <li>• Estimate the solution to a complex equation using 'trial and improvement'</li> </ul>	
<b>PROPORTION</b>	<ul style="list-style-type: none"> <li>• Know the features of graphs and tables that show direct/inverse proportion</li> <li>• Construct/use formulae describing direct/inverse proportion e.g. <math>a = kb</math></li> <li>• Know that 'y is inversely proportional to x' is equivalent to <math>y \propto 1/x</math></li> <li>• Divide in a ratio &amp; solve problems where one part or the difference is given</li> <li>• Solve more complex ratio problems e.g. comparison, mixing, concentrations</li> <li>• Solve problems combining understanding of fractions and ratio</li> </ul>	
<b>FORMULAE &amp; FUNCTIONS</b>	<ul style="list-style-type: none"> <li>• Create an expression or a formula to describe a situation</li> <li>• Change the subject of a formula involving 2 or more steps</li> <li>• Find numerical and algebraic outputs from functions</li> <li>• Identify missing operation(s) in a 1 or 2-step function machine</li> </ul>	
<b>APPROX-IMATION</b>	<ul style="list-style-type: none"> <li>• Estimate the answer to calculation involving dividing by a decimal</li> <li>• Identify minimum/maximum possible values and error intervals for integer quantities and those rounded to the nearest integer, 10, 100, 5, 20, dp, sf etc.</li> <li>• Solve simple problems involving one rounded quantity</li> <li>• Truncate a decimal number to a given number of decimal places</li> <li>• Write an error interval for a value that has been truncated</li> </ul>	
<b>GRAPHS 1</b>	<ul style="list-style-type: none"> <li>• Rearrange an equation into <math>y=mx+c</math> in order to identify the gradient etc.</li> <li>• Use a line equation to decide whether a given point would lie on the line</li> <li>• Identify the gradient, y-intercept and equation of a straight line from its graph</li> <li>• Find the equation of a line through one point with given gradient</li> <li>• Find the gradient/equation of the line through two given points</li> <li>• Interpret the gradient and y-intercept of a line graph in context</li> <li>• Plot graphs of more complex quadratic functions e.g. <math>y=x^2 - 5x + 2</math></li> <li>• Sketch simple quadratic functions e.g. <math>y=x^2 + 5</math></li> </ul>	
<b>GEOMETRY 1</b>	<ul style="list-style-type: none"> <li>• Solve problems involving the area and circumference of circles</li> <li>• Know circle definitions, including: tangent, arc, sector, segment, chord</li> <li>• Solve problems involving the area, arc length or perimeter of a sector</li> <li>• Calculate the angle/radius of a sector using the arc length or area</li> <li>• Use Pythagoras' theorem to calculate a side or angle in a right-angled triangle</li> </ul>	

	<ul style="list-style-type: none"> <li>• Use Pythagoras' theorem to determine whether a given triangle is right-angled</li> <li>• Solve a range of 2D problems using Pythagoras' theorem</li> </ul>	
<b>INEQUALITIES</b>	<ul style="list-style-type: none"> <li>• Solve a linear inequality, representing the solution on a number line</li> <li>• Solve a simple three-part inequality e.g. <math>10 &lt; 2x + 9 &lt; 31</math></li> <li>• Solve linear inequalities with negative terms of the unknown e.g. <math>20 - 3x &lt; 8</math></li> <li>• Solve a linear inequality with the unknown on both sides</li> <li>• Solve problems by constructing and solving linear inequalities in one variable</li> </ul>	
<b>PROBABILITY</b>	<ul style="list-style-type: none"> <li>• Know and use the addition law ('OR') and multiplication law ('AND')</li> <li>• Use a probability tree diagram to solve a range of problems</li> </ul>	
<b>EQUATIONS 2</b>	<ul style="list-style-type: none"> <li>• Solve two linear simultaneous equations by elimination</li> <li>• Solve problems in context by creating two simultaneous equations</li> </ul>	
<b>COMPOUND UNITS</b>	<ul style="list-style-type: none"> <li>• Solve more complex problems involving speed and convert units of speed</li> <li>• Solve simple problems involving density, understanding the units e.g. <math>\text{kg/m}^3</math></li> <li>• Solve simple problems involving pressure, units e.g. <math>\text{N/m}^2</math> or Pascals (Pa)</li> <li>• Solve problems involving rates of pay, population density and unit pricing</li> </ul>	
<b>GROWTH</b>	<ul style="list-style-type: none"> <li>• Find the result of a percentage change using a multiplier and calculator</li> <li>• Find the percentage of a given increase, decrease, profit or loss</li> <li>• Find the original amount before a percentage change</li> <li>• Calculate the result of a repeated percentage change</li> <li>• Compare investments earning simple interest and compound interest</li> <li>• Determine the number of increases/decreases by a percentage needed to obtain or exceed a given value</li> <li>• Find the result of a single fractional increase or decrease</li> <li>• Solve problems involving repeated fractional increase or decrease</li> <li>• Calculate the original value, given the result of a fractional increase/decrease</li> </ul>	
<b>GRAPHS 2</b>	<ul style="list-style-type: none"> <li>• Estimate the gradient of a curve at a particular point, using a tangent</li> <li>• Recognise, plot, sketch and interpret graphs of simple cubic functions</li> <li>• Recognise, plot, sketch and interpret graphs of simple reciprocal functions</li> <li>• Plot and interpret graphs of non-standard functions in real contexts</li> </ul>	
<b>GEOMETRY 2</b>	<ul style="list-style-type: none"> <li>• Solve more complex geometrical problems involving similar lengths</li> <li>• Finding missing lengths in similar shapes when the scale factor is a ratio</li> <li>• Enlarge a 2D shape using a fractional scale factor and a centre of enlargement</li> <li>• Identify the sf and centre of an enlargement with a fractional scale factor</li> <li>• Solve practical problems involving length, area and volume in similar figures</li> <li>• Calculate the volume or surface area of a cylinder, including in terms of <math>\pi</math></li> <li>• Solve practical problems involving the volume and surface area of solids</li> </ul>	
<b>SEQUENCES</b>	<ul style="list-style-type: none"> <li>• Find the nth term of an ascending or descending linear sequence</li> <li>• Use Fibonacci-type sequences, including with algebra e.g. a, b, ...</li> <li>• Find the <u>next terms</u> of a quadratic sequence using 1st and 2nd differences</li> <li>• Recognise/describe a simple geometric sequence, finding missing terms</li> </ul>	
<b>DATA</b>	<ul style="list-style-type: none"> <li>• Analyse and compare data including data given in more than one form</li> <li>• Plot a scatter diagram, predict using a line of best fit and identify outliers</li> <li>• Understand extrapolation and that correlation may not mean causation</li> <li>• Find the mean, median, modal class and range from a grouped table</li> <li>• Appreciate the limitations of different statistics: mean, median, mode, range</li> </ul>	
<b>TRIGONOMETRY</b>	<ul style="list-style-type: none"> <li>• Use trigonometry to find a missing side or angle in a right-angled triangle</li> <li>• Use Pythagoras' theorem to find a missing side in a right-angled triangle</li> </ul>	