

## Higher Year 10 and 11 Programme of study

Timings will vary greatly depending on the ability of the group. Students will tackle the topics relevant to their ability, indicated by the grade of individual lessons. Topics will not necessarily be completed in the order below. We are currently adapting the KS4 Scheme of Work as a consequence of the introduction of the new GCSE.

### Number

	Grade	Lesson Objective
1	C	<ul style="list-style-type: none"> <li>Write numbers in terms of their prime factors, using prime factor decomposition, and use prime factors to find the HCF and LCM.</li> </ul>
2	D, C	<ul style="list-style-type: none"> <li>Round any number to a specified accuracy, or justify their own choice of accuracy e.g. nearest integer, significant figures or decimal places.</li> <li>Understand and interpret the calculator display and know when the calculator has rounded and answer</li> <li>Understand how errors are compounded in certain calculations and not to round during intermediate steps of a calculation.</li> </ul>
3	C, B A, A*	<ul style="list-style-type: none"> <li>Recognise the limitations on the accuracy of data and measurements.</li> <li>Calculate upper and lower bounds of measurements or rounded numbers.</li> <li>Calculate upper and lower bounds for compound measures</li> </ul>
4 & 5	C, A, A*	<ul style="list-style-type: none"> <li>Distinguish between fractions that are represented by terminating and recurring decimals by examining their denominators.</li> <li>Change between fractions and decimals, including those that recur.</li> </ul>
6	D, C	<ul style="list-style-type: none"> <li>Use rounding methods to estimate answers to complex expressions.</li> </ul>

### Substitution and Formulae

	Grade	Lesson Objective
1 & 2	D	<ul style="list-style-type: none"> <li>Substitute numbers into any expression or formula. (including negatives and fractions)</li> </ul>
3		<ul style="list-style-type: none"> <li>Derive a formula from given information.</li> </ul>
4 & 5	D, C	<ul style="list-style-type: none"> <li>Use a variety of diagrams for establishing algebraic representations of a problem and its solution.</li> <li>Find a designated term of a sequence, using both term-to-term and position-to-term definitions.</li> <li>Find the nth term of a linear expression.</li> </ul>
6	B	<ul style="list-style-type: none"> <li>Find the nth term of a quadratic sequence</li> <li>Find the nth term of any sequence</li> </ul>

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<b>1</b>	Revision Lesson	Revise first 2 modules
<b>2</b>	Test	Test
<b>3</b>	Go through paper	

### Powers & Standard Index Form

	Grade	Lesson Objective
<b>1 &amp; 2</b>	D, C, B, A, A*	<ul style="list-style-type: none"> <li>• Evaluate and simplify numerical and algebraic expressions that involve fractional and negative indices.</li> <li>• Understand the term reciprocal and use this in calculation involving powers</li> </ul>
<b>3 &amp; 4</b>	C, B	<ul style="list-style-type: none"> <li>• Represent standard form as a number between 1 and 10 multiplied by a positive or negative power of ten.</li> <li>• Convert between standard form and 'normal' numbers.</li> <li>• Interpret a calculator display showing a number in standard form.</li> </ul>
<b>5</b>	B	<ul style="list-style-type: none"> <li>• Solve problems involving standard form, using calculator and non-calculator methods</li> </ul>

### Algebraic expressions and fractions

	Grade	Lesson Objective
<b>2</b>	C, B	<ul style="list-style-type: none"> <li>• Expand the product of two brackets.</li> </ul>
<b>3 &amp; 4</b>	B, A	<ul style="list-style-type: none"> <li>• Factorise quadratic expressions, including the difference of two squares.</li> </ul>
<b>5 &amp; 6</b>	D, C	<ul style="list-style-type: none"> <li>• Use the four rules of fractions (including mixed numbers)</li> </ul>
	B, A, A*	<ul style="list-style-type: none"> <li>• Simplify any algebraic expression involving fractions and, where possible, cancel common factors.</li> </ul>

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### Algebraic equations and rearranging formulae

	Grade	Lesson Objective
<b>1</b>	D, C	<ul style="list-style-type: none"> <li>Solve linear equations, including those with an unknown on both sides, those that require prior simplification (E.g. brackets), fractional equations, and those where the answers are either negative or a fraction.</li> </ul>
<b>2</b>	D, C	<ul style="list-style-type: none"> <li>Derive algebraic expressions from information given and extend this to derive equations, solving problems.</li> </ul>
<b>3</b>	C	<ul style="list-style-type: none"> <li>Find square and cube roots of decimal numbers, and solve non-linear equations using trial and improvement</li> </ul>
<b>4 &amp; 5</b>	C, B A, A*	<ul style="list-style-type: none"> <li>Rearrange formulae, including those where the potential subject occurs more than once</li> </ul>

### Algebraic Graphs

	Grade	Lesson Objective
<b>1 &amp; 2</b>	D	<ul style="list-style-type: none"> <li>Plot a straight-line graph from a given set of values.</li> </ul>
<b>3</b>	C	<ul style="list-style-type: none"> <li>Realise that an equation of the type</li> <li><math>Y=mx + c</math> represents a straight line graph, and plot this graph.</li> <li>Understand the relevance of <math>m</math> and <math>c</math> in the above equation</li> </ul>
<b>4</b>	B	Draw a straight-line graph using the cover-up method. <ul style="list-style-type: none"> <li></li> </ul>
<b>5</b>	B	<ul style="list-style-type: none"> <li>From a given graph, find the gradient and the y-intercept and hence the equation of the graph.</li> </ul>
<b>6</b>	A, A*	<ul style="list-style-type: none"> <li>Explore the gradients of lines that are parallel and perpendicular</li> </ul>
<b>7</b>	D, C	<ul style="list-style-type: none"> <li>Interpret travel graphs, and calculate with speed, distance and time (including decimal divisions of an hour).</li> </ul>
<b>8 &amp; 9</b>	B, A	<ul style="list-style-type: none"> <li>Interpret and plot real life graphs such as conversion graphs, distance-time graphs and velocity-time graphs.</li> <li>Recognise graphs e.g. filling different shaped containers</li> <li>Calculate compound measures such as density or rate of flow, and interpret this from a graph.</li> </ul>
<b>10, 11 &amp; 12</b>	C, B, A, A*	<ul style="list-style-type: none"> <li>Plot curves from given quadratic, cubic, reciprocal and exponential functions.</li> <li>Recognise the characteristic shapes of all of these functions.</li> <li>Reproduce graphs using the computer and recognise how families of curves are related.</li> </ul>

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	Grade	Lesson Objective
<b>1 &amp; 2</b>		<ul style="list-style-type: none"> <li>• Identify key questions that can be addressed by statistical methods</li> <li>• Identify possible sources of bias and plan to minimise it</li> <li>• Understand the terms census and population and the pros and cons of both</li> <li>• Select and justify a sampling scheme, including random and stratified sampling.</li> </ul>
<b>3 &amp; 4</b>		<ul style="list-style-type: none"> <li>• Collect primary data using various methods, such as observation, experiments, questionnaires and surveys.</li> <li>• Gather data from secondary sources, including printed tables and from ICT-based resources</li> <li>• Deal with practical problems such as non-response or missing data.</li> </ul>

### Processing and Representing Data 2

	Grade	Lesson Objective
<b>1</b>	B	<ul style="list-style-type: none"> <li>• Construct box plots</li> </ul>
<b>2</b>	A	<ul style="list-style-type: none"> <li>• Use frequency density to construct a histogram.</li> <li>• Use a histogram to calculate the frequency density.</li> </ul>
<b>3 &amp; 4</b>	D/C	<ul style="list-style-type: none"> <li>• Calculate means (and other averages) such as from simple data or a table,</li> <li>• Calculate mean (and other averages) from a grouped table</li> </ul>
<b>5</b>	C/B	<ul style="list-style-type: none"> <li>• Calculate moving averages and identify trends</li> </ul>
<b>6</b>	B	<ul style="list-style-type: none"> <li>• Design and complete a cumulative frequency table, identifying class boundaries where necessary.</li> </ul>
<b>7</b>	B	<ul style="list-style-type: none"> <li>• Plot a cumulative frequency curve using upper class boundaries.</li> </ul>
<b>8</b>	B	<ul style="list-style-type: none"> <li>• Solve problems using a cumulative frequency curve (<i>egg How many _____ were more than.....</i>).</li> </ul>

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### Percentages

	Starter	Grade	Lesson Objective
<b>1 &amp; 2</b>	<ul style="list-style-type: none"> <li>Change between percentages, fractions and decimals.</li> <li>Find percentages of quantities using both mental mathematics and calculator method, and solve percentage problems.</li> </ul>	D, C, B, A	<ul style="list-style-type: none"> <li>Recognise that an increase of e.g. 15% leads to 115% and a decrease of 15% leads to 85%.</li> <li>Write down a decimal multiplier that is equivalent to an increase or decrease in percentage.</li> <li>Increase and decrease quantities by a percentage, including within contexts of VAT, interest rates, and profit and loss.</li> </ul>
<b>3</b>		D, C	<ul style="list-style-type: none"> <li>Find one quantity as a percentage of another, and calculate the percentage when an actual profit or loss is given.</li> <li>Solve problems using percentages e.g. taxation, bills.</li> </ul>
<b>4</b>	•	C, B, A	<ul style="list-style-type: none"> <li>Calculate simple and compound interest.</li> </ul>
<b>5 &amp; 6</b>		C, B, A	<ul style="list-style-type: none"> <li>Find the original amount e.g. price before sale, price before VAT.</li> <li>Use multipliers to solve reverse percentage and compound interest problems.</li> </ul>

### Representing Data 2

	Grade	Lesson Objective
<b>1</b>		<ul style="list-style-type: none"> <li>Draw and interpret stem-and-leaf diagrams.</li> </ul>
<b>2</b>		<ul style="list-style-type: none"> <li>Plot and use a scatter graph to describe correlation in terms of the two variables, and as a positive, weak, negative or strong.</li> </ul>
<b>3</b>		<ul style="list-style-type: none"> <li>Draw a line of best fit where possible 'by eye', and use this to make predictions.</li> </ul>
<b>4</b>		<ul style="list-style-type: none"> <li>Compare distributions and make inferences using their shapes and measures of average and spread.</li> </ul>

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### Pythagoras Theorem

	Grade	Lesson Objective
1 & 2	C	<ul style="list-style-type: none"><li>Use Pythagoras' theorem to find the length of any side of a right-angled triangle.</li></ul>
3 & 4	C, B	<ul style="list-style-type: none"><li>Use Pythagoras' theorem to solve problems such as bearings, areas of triangles, diagonals of rectangles etc.</li></ul>
5 & 6	A, A*	<ul style="list-style-type: none"><li>Use Pythagoras' Theorem to solve problems in 3D</li></ul>

### Geometry and Trigonometry

	Grade	Lesson Objective
1	D, C	<ul style="list-style-type: none"><li>Solve problems involving interior/exterior angles of polygons (regular and irregular), and understand the concept and limitations of tessellation.</li></ul>
4	B, A A, A*	<ul style="list-style-type: none"><li>Solve problems including those that involve angles of elevation and depression.</li></ul>
5	A*	<ul style="list-style-type: none"><li>Apply trigonometric ratios and Pythagoras' theorem to solve assorted problems in 3D.</li></ul>

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### : Further Trigonometry –

	Grade	Lesson Objective
<b>1</b>	A*	<ul style="list-style-type: none"> <li>• Draw, sketch and describe the graphs of trigonometric functions for angles of any size</li> </ul>
<b>2</b>	A*	<ul style="list-style-type: none"> <li>• Use the graphs of sine &amp; cosine to find angles that satisfy simple equations</li> </ul>
<b>3</b>	A, A*	<ul style="list-style-type: none"> <li>• Use the sine rule to find the size of an angle or side in a non-right-angled triangle.</li> </ul>
<b>4</b>	A, A*	<ul style="list-style-type: none"> <li>• Use the cosine rule to find the size of an angle or side in a non-right-angled triangle.</li> </ul>
<b>5</b>	A, A*	<ul style="list-style-type: none"> <li>• Solve problems (including those involving bearings) using the sine and cosine rules.</li> </ul>
<b>6</b>	A, A*	<ul style="list-style-type: none"> <li>• Find the area of a triangle using <math>\frac{1}{2}ab \sin C</math></li> </ul>

### 3D shape, volume and surface area

	Grade	Lesson Objective
<b>1 &amp; 2</b>	D, C, B	<ul style="list-style-type: none"> <li>• Calculate the area of simple shapes, such as rectangles, squares, triangles, parallelograms, trapezium, kites and composites of rectangles and triangles.</li> <li>•</li> </ul>
<b>3 &amp; 4</b>	D, C A, A*	<ul style="list-style-type: none"> <li>• Calculate the circumference and area of a circle</li> <li>• Calculate the lengths of arcs and areas of sectors.</li> <li>• Do above calculations leaving <math>\pi</math> as part of an irrational answer.</li> </ul>

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### 3D shape, volume and surface area

	Grade	Lesson Objective
<b>7</b>	B, A, A*	<ul style="list-style-type: none"><li>Calculate the volume of pyramids</li></ul>
<b>8</b>	A, A*	<ul style="list-style-type: none"><li>Calculate the volume and surface area of cones</li></ul>
<b>9</b>	A	<ul style="list-style-type: none"><li>Calculate the volume and surface area of spheres</li></ul>
<b>10</b>	D, C, B	<ul style="list-style-type: none"><li>Recognise whether a formula represents a length, area or volume by considering its dimensions</li></ul>

### Ratio and proportion

	Grade	Lesson Objective
<b>1</b>	D, C	<ul style="list-style-type: none"><li>Solve word problems about ratio and proportion problems (e.g. recipes) using the unitary method or other informal strategies.</li></ul>
<b>2</b>	C	<ul style="list-style-type: none"><li>Divide a quantity into a given ratio (in 2 or 3 parts)</li></ul>
<b>3 &amp; 4</b>	D, A	<ul style="list-style-type: none"><li>Define direct proportion</li><li>Calculate an unknown quantity from quantities that are in direct proportion.</li><li>Set up and use equations to solve word and other problems involving direct proportion.</li></ul>
<b>5</b>	A	<ul style="list-style-type: none"><li>Define inverse proportion</li><li>Calculate an unknown quantity from quantities that are in inverse proportion.</li><li>Set up and use equations to solve word and other problems involving inverse proportion.</li></ul>



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### Transformations, Congruence & Similarity

	Grade	Lesson Objective
1	C, B	<ul style="list-style-type: none"><li>Recognise when two shapes are congruent &amp; prove the congruence of triangles using the formal arguments of SSS, SAS, ASA and RHS conditions.</li><li>Recognise translations as sliding movements and translate simple 2D shapes within a plane using words or vector notation.</li></ul>
2	D, C	<ul style="list-style-type: none"><li>Reflect shapes and identify equations of mirror lines, including diagonal lines (<math>y=x</math>, <math>y=-x</math>)</li></ul>
3	D, C	<ul style="list-style-type: none"><li>Rotate 2D shapes following instruction and describe a rotation in full.</li></ul>
4 & 5	C, B	<ul style="list-style-type: none"><li>Enlarge shapes using a variety of positive, negative, integer and fractional scale factors, and using a centre of enlargement.</li><li>Use scale to interpret maps and complete scale drawings.</li></ul>
6	C, B	<ul style="list-style-type: none"><li>Recognise properties that are preserved, and those that are changed under transformations (i.e. are object and image congruent?).</li><li>Recognise combinations of transformations and describe them in full.</li></ul>
7	C, B, A	<ul style="list-style-type: none"><li>Calculate missing sides of triangles and other shapes using similarity</li></ul>
8	A, A*	<ul style="list-style-type: none"><li>Understand and use the effect of enlargement on the area and volume of a shape, by considering scale factors.</li></ul>

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### Vectors

	Grade	Lesson Objective
1 & 2	A, A*	Understand and use vector notation. Calculate the sum and difference of two vectors Represent graphically the sum and difference of two vectors Use the commutative and associative properties of vector addition <ul style="list-style-type: none"><li>Calculate a scalar multiple of a vector</li></ul> Represent graphically a scalar multiple of a vector.
3 & 4	A*	Solve simple geometrical problems in 2D using vector methods.

### Formulae

	Grade	Lesson Objective
1 & 2	D, C	<ul style="list-style-type: none"><li>Use a variety of diagrams for establishing algebraic representations of a problem and its solution.</li><li>Find a designated term of a sequence, using both term-to-term and position-to-term definitions.</li><li>Find the nth term of a linear expression.</li></ul>
3	B	<ul style="list-style-type: none"><li>Find the nth term of a quadratic sequence</li><li>Find the nth term of any sequence</li></ul>

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### Surds

	Grade	Lesson Objective
1	A	<ul style="list-style-type: none"><li>Understand the concept of a root being an irrational number and leave answers to problems in surd form.</li><li>Simplify numeric calculations by manipulating surds.</li></ul>
2 & 3	A*	<ul style="list-style-type: none"><li>Rationalise a denominator.</li><li>Use surds in exact calculations</li></ul>
4	A*	<ul style="list-style-type: none"><li>Work out the trigonometric ratios of <math>30^\circ</math>, <math>45^\circ</math> &amp; <math>60^\circ</math> in surd form</li></ul>

### Circles

	Grade	Lesson Objective
1 & 2	B, A	<ul style="list-style-type: none"><li>Calculate angles in circles using the rule that an angle at the centre is twice that at the circumference</li><li>Calculate angles in circles using the rule that the angle at the circumference of a semicircle is <math>90^\circ</math></li><li>Calculate angles in circles using the rule that angles at the circumference in the same segment are equal</li></ul>
3	B, A, A*	<ul style="list-style-type: none"><li>Calculate angles in a cyclical quadrilateral</li></ul>
4	B, A, A*	<ul style="list-style-type: none"><li>Calculate angles within circles using rules relating to tangents and radii.</li></ul>
5	A, A*	<ul style="list-style-type: none"><li>Calculate angles in circles using the alternate segment theorem.</li></ul>
6 & 7		<ul style="list-style-type: none"><li>Calculate missing angle in mixed problems</li></ul>
8		<ul style="list-style-type: none"><li>Express a circle of radius <math>r</math> and centre <math>(0,0)</math> in an algebraic form</li></ul>

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### Quadratic equations

	Grade	Lesson Objective
1, 2 & 3	C, B, A	<ul style="list-style-type: none"><li>Solve quadratic equations by factorising</li></ul>
4 & 5	A, A*	<ul style="list-style-type: none"><li>Solve quadratic equations by completing the square</li></ul>
6 & 7	A	<ul style="list-style-type: none"><li>Solve quadratic equations using the quadratic formula</li></ul>
8 & 9	A, A*	<ul style="list-style-type: none"><li>Solve problems involving quadratic equations</li></ul>

### Algebraic expressions and fractions

	Grade	Lesson Objective
1	D, C	<ul style="list-style-type: none"><li>Remove and factorise a single pair of brackets - including cases where variables are removed as part of the factor.</li></ul>
2	C, B	<ul style="list-style-type: none"><li>Expand the product of two brackets.</li></ul>
3	B, A	<ul style="list-style-type: none"><li>Factorise quadratic expressions, including the difference of two squares.</li></ul>
4	D, C	<ul style="list-style-type: none"><li>Use the four rules of fractions (including mixed numbers)</li></ul>
	B, A, A*	<ul style="list-style-type: none"><li>Simplify any algebraic expression involving fractions and, where possible, cancel common factors.</li></ul>

### Simultaneous Equations and Inequalities

	Grade	Lesson Objective
1 & 2	B	<ul style="list-style-type: none"><li>Revise drawing graphs</li><li>Solve two linear simultaneous equations graphically</li></ul>
3 & 4	B, A	<ul style="list-style-type: none"><li>Solve two linear simultaneous equations by eliminating a variable or by substitution</li><li>Solve problems involving linear simultaneous equations</li></ul>
5	C, B	<ul style="list-style-type: none"><li>Solve linear inequalities</li><li>Represent solutions on a number line</li></ul>
6 & 7	B	<ul style="list-style-type: none"><li>Solve quadratic inequalities</li></ul>

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<b>8</b>	D, C, B, A	<ul style="list-style-type: none"> <li>Solve problems that involve inequalities</li> </ul>
<b>9</b>	C, B	<ul style="list-style-type: none"> <li>Find regions that represent more than one graphical inequality</li> </ul>
<b>10 &amp; 11</b>	A*	<ul style="list-style-type: none"> <li>Solve simultaneous equations graphically, where one of the equations is quadratic or cubic</li> </ul>
<b>12</b>	A*	<ul style="list-style-type: none"> <li>Solve, by substitution, two simultaneous equations where one is linear and one is quadratic or of the form <math>x^2 + y^2 = r^2</math></li> </ul>

### Percentages

	Grade	Lesson Objective
<b>1</b>	D, C, B, A	<ul style="list-style-type: none"> <li>Recognise that an increase of e.g. 15% leads to 115% and a decrease of 15% leads to 85%.</li> <li>Write down a decimal multiplier that is equivalent to an increase or decrease in percentage.</li> <li>Increase and decrease quantities by a percentage, including within contexts of VAT, interest rates, and profit and loss.</li> </ul>
<b>2</b>	D, C	<ul style="list-style-type: none"> <li>Find one quantity as a percentage of another, and calculate the percentage when an actual profit or loss is given.</li> <li>Solve problems using percentages e.g. taxation, bills.</li> </ul>
<b>3</b>	C, B, A	<ul style="list-style-type: none"> <li>Calculate simple and compound interest.</li> </ul>
<b>4</b>	C, B, A	<ul style="list-style-type: none"> <li>Find the original amount e.g. price before sale, price before VAT.</li> <li>Use multipliers to solve reverse percentage and compound interest problems.</li> </ul>

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### Probability

	Grade	Lesson Objective
1	C	<ul style="list-style-type: none"> <li>• Solve problems involving experimental probability</li> <li>• Use probabilities to answer questions on expectation</li> </ul>
2	C	<ul style="list-style-type: none"> <li>• Calculate probabilities for mutually exclusive and exhaustive events</li> </ul>
3	C	<ul style="list-style-type: none"> <li>• Complete sample space diagrams and use to calculate probabilities</li> </ul>
4 & 5	B	<ul style="list-style-type: none"> <li>• Know when to use the <math>P(A) + P(B)</math> 'OR' rule, and the <math>P(A) \times P(B)</math> 'AND' rule</li> </ul>
6 & 7	B	<ul style="list-style-type: none"> <li>• Complete tree diagrams as a means of showing outcomes for 2 successive events and use them to solve probability problems</li> </ul>
8 & 9	A, A*	<ul style="list-style-type: none"> <li>• Differentiate between dependent and independent events</li> <li>• Calculate probabilities of independent events</li> </ul>
10	A*	<ul style="list-style-type: none"> <li>• Solve problems involving conditional probability</li> </ul>

### Algebraic graphs

	Grade	Lesson Objective
1	D	<ul style="list-style-type: none"> <li>• Plot a straight-line graph from a given set of values.</li> </ul>
2	C	<ul style="list-style-type: none"> <li>• Realise that an equation of the type</li> <li>• <math>Y=mx + c</math> represents a straight line graph, and plot this graph.</li> <li>• Understand the relevance of <math>m</math> and <math>c</math> in the above equation</li> </ul>
3	B	<ul style="list-style-type: none"> <li>• Draw a straight-line graph using the cover-up method.</li> </ul>
4	B	<ul style="list-style-type: none"> <li>• From a given graph, find the gradient and the y-intercept and hence the equation of the graph.</li> </ul>
5	A, A*	<ul style="list-style-type: none"> <li>• Explore the gradients of lines that are parallel and perpendicular</li> </ul>
6	D, C	<ul style="list-style-type: none"> <li>• Interpret travel graphs, and calculate with speed, distance and time (including decimal divisions of an hour).</li> </ul>
7	C, B, A, A*	<ul style="list-style-type: none"> <li>• Plot curves from given quadratic, cubic, reciprocal and exponential functions.</li> <li>• Recognise the characteristic shapes of all of these functions.</li> <li>• Reproduce graphs using the computer and recognise how families of curves are related.</li> </ul>

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### Constructions and Loci

	Grade	Lesson Objective
1		<ul style="list-style-type: none"><li>Construct shapes from given information using a protractor and a ruler.</li></ul>
2		<ul style="list-style-type: none"><li>Construct unique triangles using SSS, SAS, ASA and RHS conditions.</li><li>Construct triangles using SSA and understand that they are not unique</li></ul>
3 & 4		<ul style="list-style-type: none"><li>Construct the following using only compasses and a ruler:<ul style="list-style-type: none"><li>Perpendicular bisector</li><li>Midpoint of a line</li><li>Angle bisector.</li></ul></li></ul>
5		<ul style="list-style-type: none"><li>Construct the following using only compasses and a ruler:<ul style="list-style-type: none"><li>An angle of <math>60^\circ</math></li><li>Perpendicular from a point to a line</li><li>Triangles and other shapes with angles of <math>30^\circ</math>, <math>45^\circ</math>, <math>60^\circ</math> &amp; <math>90^\circ</math> or combinations of</li></ul></li></ul>
6		<ul style="list-style-type: none"><li>Construct LOCI in terms of distance from a point, equidistance from two points, distance from a line, equidistance from two lines and line of sight.</li></ul>
7 & 8		<ul style="list-style-type: none"><li>Shade regions using LOCI to solve problems e.g. vicinity to lighthouse/port.</li></ul>

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### Geometry and Trigonometry

	Grade	Lesson Objective
1	D, C	<ul style="list-style-type: none"><li>Solve problems involving interior/exterior angles of polygons (regular and irregular), and understand the concept and limitations of tessellation.</li></ul>
2	B	<ul style="list-style-type: none"><li>Identify appropriately the various sides of a right-angled triangle as the Hypotenuse, Opposite and Adjacent.</li><li>Recall the ratio for sine, cosine, and tangent and identify which are required to solve a problem.</li><li>Use the appropriate ratio to find the lengths of sides in a right-angled triangle.</li><li>Use information given, to find angles using the appropriate ratio.</li></ul>
3	A*	<ul style="list-style-type: none"><li>Apply trigonometric ratios and Pythagoras' theorem to solve assorted problems in 3D.</li></ul>
4	A*	<ul style="list-style-type: none"><li>Draw, sketch and describe the graphs of trigonometric functions for angles of any size</li></ul>
5	A*	<ul style="list-style-type: none"><li>Use the graphs of sine &amp; cosine to find angles that satisfy simple equations</li></ul>
6	A, A*	<ul style="list-style-type: none"><li>Use the sine rule to find the size of an angle or side in a non-right-angled triangle.</li></ul>
7	A, A*	<ul style="list-style-type: none"><li>Use the cosine rule to find the size of an angle or side in a non-right-angled triangle.</li></ul>



## Higher Year 10 and 11 Programme of study

### Transformations of graphs

	Grade	Lesson Objective
1, 2 & 3	A*	<ul style="list-style-type: none"> <li>• Given the graph of <math>y = f(x)</math>, be able to sketch the graphs of <math>y = f(x) + a</math>, <math>y = f(ax)</math>, <math>y = f(x+a)</math>, <math>y = af(x)</math> and <math>y = -f(x)</math> by applying transformations.</li> <li>• Draw such graphs of combined transformations such as <math>y = a + b \sin x</math>.</li> </ul> <p style="text-align: center;">Give equations of graphs which have been transformed</p>

### Processing and Representing Data

	Grade	Lesson Objective
1	B	<ul style="list-style-type: none"> <li>• Construct box plots</li> </ul>
2	A	<ul style="list-style-type: none"> <li>• Use frequency density to construct a histogram.</li> <li>• Use a histogram to calculate the frequency density.</li> </ul>
3	D/C	<ul style="list-style-type: none"> <li>• Calculate means (and other averages) such as from simple data or a table,</li> <li>• Calculate mean (and other averages) from a grouped table</li> </ul>
4	C/B?	<ul style="list-style-type: none"> <li>• Calculate moving averages and identify trends</li> </ul>

### Proof

	Grade	Lesson Objective
1 & 2	B A A*	<ul style="list-style-type: none"> <li>• Explain the difference between a proof and a demonstration</li> <li>• Verify results by using substitution</li> <li>• Show that an algebraic statement is true</li> <li>• Prove algebraic and geometric results</li> </ul>

## Higher Year 10 and 11 Programme of study

### Further Trigonometry –

	Grade	Lesson Objective
1	A*	<ul style="list-style-type: none"><li>• Draw, sketch and describe the graphs of trigonometric functions for angles of any size</li></ul>
2	A*	<ul style="list-style-type: none"><li>• Use the graphs of sine &amp; cosine to find angles that satisfy simple equations</li></ul>
3	A, A*	<ul style="list-style-type: none"><li>• Use the sine rule to find the size of an angle or side in a non-right-angled triangle.</li></ul>
4	A, A*	<ul style="list-style-type: none"><li>• Use the cosine rule to find the size of an angle or side in a non-right-angled triangle.</li></ul>
5	A, A*	<ul style="list-style-type: none"><li>• Solve problems (including those involving bearings) using the sine and cosine rules.</li></ul>
6	A, A*	<ul style="list-style-type: none"><li>• Find the area of a triangle using <math>\frac{1}{2}ab \sin C</math></li></ul>