

Maths			Year: 11		
AUTUMN		SPRING		SUMMER	
Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
<b>Theme/ topic:</b> <b>Vectors</b> <b>Non-linear Graphs</b>	<b>Theme/ topic:</b> <b>Algebra</b>	<b>Theme/ topic:</b> <b>Reasoning</b>	<b>Theme/ topic:</b> <b>Revision and Communication</b>	<b>Theme/ topic:</b> <b>Revision</b>	<b>Theme/ topic:</b> -
<b>By the end of this half term pupils will know</b>	<b>By the end of this half term pupils will know</b>	<b>By the end of this half term pupils will know</b>	<b>By the end of this half term pupils will know</b>	<b>By the end of this half term pupils will know</b>	<b>By the end of this half term pupils will know</b>
The difference between vector and scalar quantities Vectors represent movement from one point to another Different representations of vectors (Column vectors and line segments) <b>Key vocabulary</b> – vector, scalar, column, line, arrow, direction,	The difference between an expression, an equation and an identity The different forms of a quadratic expression ( $ax^2 + bx + c$ , factorised, completed square) A quadratic equation can have 0, 1 or 2 solutions	Multiplicative reasoning examines situations involving ratio and proportion Geometric reasoning examines situations involving circle theorems, trigonometry and Pythagoras Algebraic reasoning examines situations involving sequences and equations	The requirements for worded answers in GCSE examinations on transformations The requirements for construction questions in GCSE examinations <b>Key vocabulary</b> – reflection, rotation, enlargement, translation, symmetry, vertex, point, side, mirror line, clockwise, anti-clockwise, centre, order, vector, axes, scale factor, congruent,		

<p>size, magnitude, resultant</p> <p>The algebraic form of quadratic, cubic and reciprocal expressions</p> <p>Different representations (numerical, algebraic, graphical, diagrammatic)</p> <p>Non-linear graphs are displayed as smooth curves</p> <p>The differences between non-linear graphs</p> <p><b>Key vocabulary</b> – quadratic, cubic, reciprocal, expression, equation, curve, substitute, parabola, vertical, horizontal, estimate, cube, asymptote, infinity, tends towards, intercept, gradient,</p>	<p>The subject of a formula is the letter on its own</p> <p><math>f(x)</math> reads as <math>f</math> of <math>x</math></p> <p>Different letters can be used for functions (<math>f(x)</math>, <math>g(x)</math>, <math>h(x)</math>...)</p> <p>The difference between <math>f(x)</math> and <math>f(2)</math></p> <p><b>Key vocabulary</b> – expand, factorise, multiply, coefficient, bracket, identity, expressions, equation, HCF, binomial, simplify, terms, quadratic, difference of 2 squares, factor, solve, solution, product, roots, inequalities, unknown, rearrange, inverse, subject, input, output, variable, operation, formula, function, evaluate</p>	<p>Different representations of direct proportion (words, graphs, equations)</p> <p>Graphs of direct proportion go through the origin and are straight lines</p> <p><math>y=kx</math> for direct proportion</p> <p>Density = <math>\text{mass} \div \text{volume}</math></p> <p>Pressure = <math>\text{force} \div \text{area}</math></p> <p>Angle rules (points, parallel lines, polygons)</p> <p>Pythagoras' Theorem <math>a^2 + b^2 = c^2</math></p> <p>SOHCAHTOA</p> <p><b>Key vocabulary</b> – multiplicative, geometric, algebraic, scale factor, multiplier, similar, enlargement, direct proportion, equation, origin, constant, straight line,</p>	<p>similar, multiplier, single, series, construct, bisector, perpendicular, locus / loci, equidistant, circle, arc</p>		
---	---	---	--	--	--

roots, coordinates, turning points		multiplier, density, mass, volume, pressure, force, area, angle, adjacent, vertically opposite, point, straight line, parallel, corresponding, allied, alternate, bearing, polygon, regular, interior, exterior, equilateral, isosceles, trapezium, proof, opposite, adjacent, hypotenuse, inverse, ratio			
<b>They will understand</b>	<b>They will understand</b>	<b>They will understand</b>	<b>They will understand</b>	<b>They will understand</b>	<b>They will understand</b>
Vector notation Vector representations Negative vectors Vector multiplication Vector addition & subtraction Vector journeys Substitution with indices	Expanding brackets Factorising quadratic expressions Difference of 2 squares Solving a quadratic equation Changing the subject of formulae Function notation $f(x)$	Direct proportion Graphs of direct proportion $y=kx$ Pressure Density Angle rules Trigonometric ratios	Reflection (mirror line) Rotation (centre of rotation, direction, angle) Translation (vector translation) Enlargement (centre of enlargement, scale factor) Bisectors		

Plotting non-linear graphs Roots/ solutions of quadratic graphs Shapes of non-linear graphs	Substituting into functions	Pythagoras' Theorem	Construction methods Loci		
<b>They will know how to</b>	<b>They will know how to</b>	<b>They will know how to</b>	<b>They will know how to</b>	<b>They will know how to</b>	<b>They will know how to</b>
Understand and represent vectors and vector journeys Use and read vector notation Draw and understand vectors multiplied by a scalar Draw and understand addition and subtraction of vectors Interpret and solve problems involving vectors Complete a table of values for non-linear graphs	Factorise quadratic expressions Solve quadratic equations equal to 0 by factorisation Interpret and solve problems involving quadratic equations Form and solve equations and inequalities in context Change the subject of increasingly complex formulae Rearrange familiar formulae from other subjects	Apply prior knowledge (scale factors, ratio) to more complex situations and problems Understand direct proportion Recognise graphs of direct proportion Interpret and solve problems involving direct proportion Calculate with pressure and density Understand inverse proportion	Apply prior knowledge (transformations, constructions) to more complex situations and problems Describe transformations using the correct terminology Complete given transformations Complete constructions, using rulers and compasses, leaving construction lines visible Apply constructions to loci problems		

<p>Plot (smooth curve) and read from quadratic, cubic and reciprocal graphs</p> <p>Recognise shapes of graphs and match to equations</p> <p>Identify and interpret roots and intercepts of quadratics</p> <p>Solve quadratic graphs graphically</p> <p>Interpret and solve problems involving non-linear graphs</p>	<p>Substitute into expressions, formulae and functions</p> <p>Use function notation</p> <p>Evaluate functions</p>	<p>Interpret and solve problems involving inverse proportion</p> <p>Calculate missing angles in a variety of situations</p> <p>Prove angle rules</p> <p>Interpret and solve problems involving angles</p> <p>Support solutions by stating correct angle rules</p> <p>Find missing sides using Pythagoras'</p> <p>Finding missing sides and angles using Trigonometry</p> <p>Identify when to use Pythagoras and when to use Trigonometry in right-angled triangles</p> <p>Interpret and solve problems involving Pythagoras and Trigonometry</p>			
---	---	--	--	--	--

Link to prior learning	Link to prior learning	Link to prior learning	Link to prior learning	Link to prior learning	Link to prior learning
Vectors to describe translations	Expanding single brackets and binomials	Ratio	Transformations		
Addition, subtraction & multiplication	Factorising with single brackets	Direct & inverse proportion	Construction		
Solving quadratics algebraically	HCF, LCM	Speed, distance, time	Loci		
Algebraic substitution	Solving equations	Scale factors	Similarity & congruence		
Coordinates	Solving inequalities	Similar shapes	Vectors		
Plotting linear graphs	Changing the subject of formulae	Angle rules	Equations of straight lines		
Equations of horizontal and vertical lines	Substitution	Circle theorems			
Indices	Function machines	Pythagoras			
		Trigonometry			
		Bearings			
		Vectors			
		Sequences			
		Forming and solving equations & inequalities			
		Substitution			