

National 5 Topics					
	Description	1	2	3	exam
Expression and Formulae					
1.1	Rules for Surds including zero, negatives and fractional indices				
	Collecting "like" surds				
	Simplifying surds				
	Rationalising a denominator				
	Evaluate surds and indices without a calculator				
1.2	Expanding brackets				
	Factors – Common factor				
	Factors – Difference of two squares				
	Factors – Trinomial expressions				
	Completing the square				
1.3	Algebraic Fractions Simplify				
	Algebraic Fractions Add/Subtract				
	Algebraic Fractions Multiply/divide				
	Algebraic Fractions equations with fractions				
1.4	Gradient formula				
	Length of an arc				
	Area of a sector				
	Volume of a prism/non-prisms				
	Surface area prism/non-prisms				
	Rounding/significant figures				
Relationships					
1.1	Equation of line $y = mx + c$				
	Equation of line $y - b = m(x - a)$				
	Equations of horizontal and vertical lines				
	Solving linear equations				
	Solving linear inequalities				
	Using function notation (substituting a simple algebraic term)				
	Using function notation (substituting values)				
	Using function notation (working backwards)				
	Straight line mathematical modelling and problem solving				
	Simultaneous equations				
	Changing the subject of a formula				
1.2	Transformation of quadratic graphs (completing the square T.P.)				
	Sketching quadratic graphs (transformations and finding roots)				
1.3	Quadratics, solution by : sketch, factorising, completing the square, quadratic formula				

1.4	Apply Pythagoras' theorem to 3D shapes				
	Converse of Pythagoras' theorem				
	Angle in a semi-circle				
	Tangent to a circle				
	Perpendicular bisector of a chord				
	Use linear scale factor to calculate missing lengths				
	Similar and congruent triangles				
	Area scale factor				
	Volume scale factor				
1.5	Trig graphs : period, amplitude, max, min, zeroes				
	Transformation of graphs and equations				
	Solving trig. equations				
	Trig. identities				
Applications					
1.1	Area of a Triangle				
	Sine Rule				
	Cosine Rule				
	Triangles and bearings				
1.2	Addition/Subtraction of vectors				
	Find coordinate from 3D diagram				
	Magnitude				
	Component form (column and i, j, k)				
	Position Vectors				
	Identify a path of known vectors				
1.3	Reverse percentages				
	Appreciation/Depreciation with/without compound interest				
	BoDMAS fractions proper/improper				
1.4	Median, quartiles and Interquartile range				
	Stem-and-leaf diagrams				
	Comparing distributions				
	Mean and standard deviation				
	Scattergraph and line of best fit				
	Describing correlations				
$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$ $A = \frac{1}{2}ab \sin C \quad \cos A = \frac{b^2 + c^2 - a^2}{2bc}$ $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ $V = \frac{4}{3}\pi r^3 \quad V = \frac{1}{3}Ah$ $a^2 = b^2 + c^2 - 2bc \cos A$ $s = \sqrt{\frac{\sum x^2 - \frac{(\sum x)^2}{n}}{n-1}}$		$A = \pi r^2 \quad m = \frac{y_2 - y_1}{x_2 - x_1} \quad \sin x^\circ = \frac{\text{Opp}}{\text{Hyp}} \quad \cos x^\circ = \frac{\text{Adj}}{\text{Hyp}} \quad \tan x^\circ = \frac{\text{Opp}}{\text{Adj}}$ $C = \pi d \quad \frac{Q_3 - Q_1}{2} \quad \frac{\theta}{360} = \frac{\text{arc}}{\pi d} = \frac{\text{sector}}{\pi r^2} \quad \tan x = \frac{\sin x}{\cos x} \quad \sin^2 x + \cos^2 x = 1$ $\text{Prism: } V = Ah \quad a = \sqrt{a_1^2 + a_2^2 + a_3^2} \quad A_\Delta = \frac{1}{2}bh \frac{\text{change}}{\text{original}} \times 100$ $\text{Cylinder: } V = \pi r^2 h \quad y - b = m(x - a) \quad \text{Red sf} = \frac{\text{small}}{\text{big}}$ $a^m \times a^n = a^{m+n} \quad \frac{a^m}{a^n} = a^{m-n} \quad (a^m)^n = a^{m \times n} \quad \text{Enl sf} = \frac{\text{big}}{\text{small}}$ $a^{\frac{m}{n}} = \sqrt[n]{a^m} \quad \frac{1}{a^m} = a^{-m} \quad \sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}} \quad a^0 = 1 \quad a^1 = a \quad \text{Area sf} = sf^2$ $\sqrt{a} \times \sqrt{b} = \sqrt{ab} \quad a^2 + b^2 = c^2 \quad b^2 - 4ac \quad \text{Vol sf} = sf^3$			

