National 5 Mathematics Course outline
June

Skill	Content	Website Links
Working with surds	♦ Simplification ♦ Rationalising denominators	https://www.bbc.com/bitesize/guides/z9jtw6f/revision/1
Simplifying expressions using the laws of indices	♦ Multiplication and division using positive and negative indices including fractions ♦ Calculations using scientific notation ♦ $(a^m)^n = a^{mn}$	http://www.national5maths.co.uk/wp-content/uploads/2016/01/Indices-Credit-1.pdf http://www.national5maths.co.uk/wp-content/uploads/2016/01/Scientific-Notation-Credit.pdf
Working with algebraic expressions involving expansion of brackets	♦ a(bx + c) + d(ex + f) ♦ ax(bx + c) ♦ (ax + b)(cx + d) ♦ (ax + b)(cx^2 + dx + e) where a, b, c, d, e, f are integers	https://www.bbc.com/bitesize/guides/z2yg87h/revision/1
Factorising an algebraic expression	♦ Common factor ♦ Difference of squares $p^2 x^2 – a^2$ ♦ Common factor with difference of squares ♦ Trinomials with unitary x^2 coefficient ♦ Trinomials with non-unitary x^2 coefficient	http://www.national5maths.co.uk/wp-content/uploads/2016/01/Factorising-Credit.pdf https://www.bbc.com/bitesize/guides/zmvrd2p/revision/1

National 5 Mathematics Course outline
August/September

Factorising an algebraic Expression (continued)	Extend to: ♦ Solving from factorised form ♦ Solving using quadratic formula	http://www.national5maths.co.uk/wp-content/uploads/2016/01/Factorising-Credit.pdf https://www.bbc.com/bitesize/guides/zmvrd2p/revision/1
Completing the square in a quadratic expression with unitary x^2 coefficient		https://www.bbc.com/bitesize/guides/zxcjrwx/revision/1
Reducing an algebraic fraction to its simplest form	♦ a / b where a,b are of the form $(x + p)^n$ or $(x + p)(x + q)$	http://www.national5maths.co.uk/wp-content/uploads/2016/01/Algebraic-Fractions-Credit.pdf https://www.bbc.com/bitesize/guides/zwv9y4j/revision/1
Applying one of the four operations to algebraic fractions	♦ a / b*c / d where a, b, c, d can be simple constants or variables. *can be add, subtract, multiply or divide	https://www.bbc.com/bitesize/guides/zgtv6yc/revision/1
September Progress Test		
Determining the gradient of a straight line, given two points	$m = \frac{y_2 - y_1}{x_2 - x_1}$	https://www.bbc.com/bitesize/guides/z8383k7/revision/1

National 5 Mathematics Course outline
August/September

Determining the equation of a straight line, given the gradient	♦ Use the formula $y - b = m(x - a)$ or equivalent to find the equation of a straight line, given one point and the gradient of the line ♦ Use functional notation $f(x)$ ♦ Identify gradient and y -intercept from $y = mx + c$ ♦ Identify gradient and y-intercept from various forms of the equation of a straight line	http://www.national5maths.co.uk/wp-content/uploads/2016/01/Straight-Line-Credit.pdf https://www.bbc.com/bitesize/guides/z24qcj6/revision/1
Calculating the length of arc or the area of a sector of a circle		https://www.bbc.com/bitesize/guides/zwcqcj6/revision/1
Calculating the volume of a standard solid	♦ sphere, cone, pyramid	http://www.national5maths.co.uk/wp-content/uploads/2016/01/Area-Volume-Credit.pdf https://www.bbc.com/bitesize/guides/z9bdb82/revision/1
(Rounding to a given number of significant figures)		https://www.bbc.com/bitesize/guides/zpc82hv/revision/1
Calculating the area of a triangle using trigonometry	♦ Area = $\frac{1}{2}absinC$	https://www.bbc.com/bitesize/guides/zytbh39/revision/1 https://www.bbc.com/bitesize/guides/z84297h/revision/1 https://www.bbc.com/bitesize/guides/zqwhjty/revision/1
Using the sine and cosine rules to find a side or angle	♦ Sine rule for side or angle ♦ Cosine rule for side ♦ Cosine rule for angle	
Using bearings with trigonometry	♦ To find a distance or direction	

National 5 Mathematics Course outline
October

Skill	Content	Website Links
Working with percentages	♦ Use reverse percentages to calculate an original quantity ♦ Appreciation including compound interest ♦ Depreciation	http://www.national5maths.co.uk/wp-content/uploads/2016/01/Percentages-Credit.pdf https://www.bbc.com/bitesize/guides/z8tv6yc/revision/1 https://www.bbc.com/bitesize/guides/z37pqhv/revision/1
Working with fractions	♦ Operations and combinations of operations on fractions including mixed numbers (Addition, subtraction, multiplication, division)	https://www.bbc.com/bitesize/guides/z2b83k7/revision/1
Working with 2D vectors	♦ Adding or subtracting two-dimensional vectors using directed line segments	Working with 2D vectors. Working with 3D coordinates. Vector components. Calculating the magnitude of a vector.
Working with 3D coordinates	♦ Determining coordinates of a point from a diagram representing a 3D object	
Using vector components	♦ Adding or subtracting two- or three-dimensional vectors using components ♦ Magnitude of a two or three dimensional vector	
Comparing data sets using statistics	Compare data sets using calculated/determined: ♦ interquartile range ♦ standard deviation	https://www.bbc.com/bitesize/guides/z94297h/revision/1
Forming a linear model from a given set of data	♦ Determine the equation of a best-fitting straight line on a scattergraph and use it to estimate y given x	https://www.bbc.com/bitesize/guides/zq7s2nb/revision/1

National 5 Mathematics Course outline
November/December

November Mini Prelim		
Working with linear equations and inequations	♦ Coefficients are a member of Z ♦ Solutions are a member of Q	https://www.bbc.com/bitesize/guides/zwgdb82/revision/1
Working with simultaneous equations	♦ Construct from text ♦ Graphical solution ♦ Algebraic solution	http://www.national5maths.co.uk/wp-content/uploads/2016/01/Simultaneous-Equations-Credit.pdf https://www.bbc.com/bitesize/guides/z8gdb82/revision/1
Changing the subject of a formula	♦ Linear equation ♦ Equation involving a simple square or square root	https://www.bbc.com/bitesize/guides/zx2n7p3/revision/1
Working with quadratic equations	Revise ♦ Solving from factorised form ♦ Solving using the quadratic formula Then ♦ Graphical treatment ♦ Know and use the discriminant ♦ Determine the number or nature of roots	http://www.national5maths.co.uk/wp-content/uploads/2016/01/Quadratic-Equations-Credit.pdf The Quadratic Formula. Using the discriminant to determine the number or nature of roots.
Applying the Pythagoras' theorem	♦ Using Pythagoras' theorem in complex situations including converse and 3D	https://www.bbc.com/bitesize/guides/zq8x8mn/revision/1
Applying the properties of shapes to determine an angle involving at least two steps	♦ Quadrilaterals/triangles/polygons/ circles ♦ Relationship in a circle between the centre, chord and perpendicular bisector	https://www.bbc.com/bitesize/guides/z3y9y4j/revision/1
Using similarity	♦ Interrelationship of scale — length, area and volume	http://www.national5maths.co.uk/wp-content/uploads/2016/01/Similarity-Credit.pdf https://www.bbc.com/bitesize/guides/zxmfmsg/revision/1

National 5 Mathematics Course outline
January/February

January Prelim		
Skill	**Content**	**Website Links**
Recognise and determine the equation of a quadratic function from its graph	♦ Equations of the form $y = kx^2$ and $y = (x + p)^2 + q$; k, p, q $\in Z$ ♦ Also $y = k(x + p)^2 + q$, k $\in Z$	https://www.bbc.com/bitesize/guides/zcwhjty/revision/1
Sketching a quadratic function	♦ Equations of the form $y = (x - m)(x - n)$ ♦ Also $y = k(x + p)^2 + q$, k $\in Z$	https://www.bbc.com/bitesize/guides/zq2fmsg/revision/1
Identifying features of a quadratic function	♦ Identify nature, coordinates of turning point and the equation of the axis of symmetry of a quadratic of the form ♦ $y = (x + p)^2 + q$ where k = 1 or –1	https://www.bbc.com/bitesize/guides/zxqpqhv/revision/1
Working with the graphs of trigonometric functions	♦ Basic graphs ♦ Amplitude ♦ Vertical translation ♦ Multiple angle ♦ Phase angle	http://www.national5maths.co.uk/wp-content/uploads/2016/01/Trig.-Graphs-Eqns-Credit.pdf https://www.bbc.com/bitesize/guides/zwbwgdm/revision/1
Working with trigonometric relationships in degrees	♦ Sine, cosine and tangent of angles 0°– 360° ♦ Period ♦ Related angles ♦ Solve basic equations ♦ Identities $cos^2x + sin^2x = 1$ $\quad tanx = \frac{sinx}{cosx}$	

National 5 Mathematics Course outline
February/March

Exam Revision: 100 N5 Exam type questions and answers.

Past Papers