

Further mandatory information on Course coverage

The following gives details of mandatory skills, knowledge and understanding for the National 5 Mathematics Course. Course assessment will involve sampling the skills, knowledge and understanding.

Algebraic skills	
The learner will use these algebraic skills and apply them in context	
1 - Working with algebraic expressions involving expansion of brackets	<ul style="list-style-type: none"> ◆ $a(bx+c)+d(ex+f)$ ◆ $ax(bx+c)$ ◆ $(ax+b)(cx+d)$ ◆ $(ax+b)(cx^2+dx+e)$ where a, b, c, d, e, f are integers □
2 - Factorising an algebraic expression	<ul style="list-style-type: none"> ◆ common factor ◆ difference of squares ◆ trinomials and combinations of these
3 - Completing the square in a quadratic expression with unitary x^2 coefficient	
4 - Reducing an algebraic fraction to its simplest form	a/b where a, b are of the form $(mx+p)^n$ or $(mx+p)(nx+q)$ $b \neq 0$
5 - Applying the four operations to algebraic fractions	$\frac{a}{b} * \frac{c}{d}$ where a, b, c, d can be simple constants, variables or expressions. * can be add, subtract, multiply or divide $b \neq 0, d \neq 0$
6 - Determining the equation of a straight line	<ul style="list-style-type: none"> ◆ use the formula $y-b=m(x-a)$ or equivalent to find the equation of a straight line, given two points or one point and the gradient of the line ◆ use functional notation ◆ identify gradient and y-intercept from various forms of the equation of a straight line
7 - Working with linear equations and inequations	<ul style="list-style-type: none"> ◆ numerical coefficients are rational numbers □ ◆ numerical solutions are rational numbers □
8 - Working with simultaneous equations	<ul style="list-style-type: none"> ◆ construct from text ◆ graphical solution ◆ algebraic solution
9 - Changing the subject of a formula	<ul style="list-style-type: none"> ◆ linear equation ◆ equation involving a simple square or square root
10 - 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 are integers (□)
11 - Sketching a quadratic function	Equations of the form $y=(ax-m)(bx-n)$ or the form $y=k(x+p)^2+q$ where $k=1$ or -1 a, b, m, n, p, q are integers (□)
Identifying features of a	Identify nature, coordinates of turning point and the

12-	quadratic function	equation of the axis of symmetry of a quadratic of the form $y = k(x + p)^2 + q$ where $k = 1$ or -1 p, q are integers ()
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13-	Working with quadratic equations	<ul style="list-style-type: none"> ◆ factorising ◆ graphically ◆ using the quadratic formula ◆ discriminant ◆ roots
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Geometric skills		
The learner will use these geometric skills and apply them in context		
14-	Determining the gradient of a straight line, given two points	$m = \frac{y_2 - y_1}{x_2 - x_1}$
15-	Calculating the length of arc or the area of a sector of a circle	
16-	Calculating the volume of a standard solid	Sphere, cone, pyramid
17-	Applying Pythagoras' theorem	Using Pythagoras' theorem in complex situations including converse and 3D
18-	Applying the properties of shapes to determine an angle involving at least two steps	<ul style="list-style-type: none"> ◆ quadrilaterals/triangles/polygons/circles ◆ relationship in a circle between the centre, chord and perpendicular bisector
19-	Using similarity	Interrelationship of length, area and volume
20-	Working with 2D vectors	Adding or subtracting two-dimensional vectors using directed line segments
21-	Working with 3D coordinates	Determining coordinates of a point from a diagram representing a 3D object
22-	Using vector components	Adding or subtracting two- or three-dimensional vectors using components
		Magnitude of a two or three dimensional vector

Trigonometric skills		
The learner will use these trigonometric skills and apply them in context		
23-	Working with the graphs of trigonometric functions	<ul style="list-style-type: none"> ◆ basic graphs ◆ amplitude ◆ vertical translation ◆ multiple angle ◆ phase angle
24-	Working with trigonometric relationships in degrees	<ul style="list-style-type: none"> ◆ sine, cosine and tangent of angles $0^\circ - 360^\circ$ ◆ period ◆ related angles ◆ solve basic equations ◆ identities

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cont.

	$\tan x = \frac{\sin x}{\cos x}$ $\cos^2 x + \sin^2 x = 1,$
25 -	Calculating the area of a triangle using trigonometry ♦ Area = $\frac{1}{2}ab \sin C$
26 {	Using the sine and cosine rules to find a side or angle in a triangle ♦ sine rule for side and angle ♦ cosine rule for side ♦ cosine rule for angle
	Using bearings with trigonometry ♦ To find a distance or direction

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Numerical skills The learner will use these numerical skills and apply them in context	
Working with surds	♦ simplification ♦ rationalising denominators
28 -	Simplifying expressions using the laws of indices ♦ multiplication and division using positive and negative indices including fractions ♦ $(ab)^m = a^m b^m$ ♦ $(a^m)^n = a^{mn}$ ♦ $a^{m/n} = \sqrt[n]{a^m}$ ♦ calculations using scientific notation
29 -	Rounding to a given number of significant figures
30 -	Working with percentages ♦ use reverse percentages to calculate an original quantity ♦ appreciation including compound interest ♦ depreciation
31 -	Working with fractions Operations and combinations of operations on fractions including mixed numbers (Addition, subtraction, multiplication, division)

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Statistical skills The learner will use these statistical skills and apply them in context	
Comparing data sets using statistics	Compare data sets using calculated/determined: ♦ semi-interquartile range ♦ standard deviation
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

Reasoning skills

The learner will use mathematical reasoning skills (these can be used in combination or separately)