Manipulating expressions

Stage 6	Stage 7	Stage 8/Foundation	Stage 9/FH	Stage 10/Higher	
	understand and use the concepts and vocabulary of expressions, equations, formulae and terms	understand and use the concepts and vocabulary of factors	understand and use the concepts and vocabulary of inequalities and identities / know the difference between an equation and an identity	simplify and manipulate algebraic expressions (including those involving surds) by expanding products of two binomials and factorising quadratic expressions of the form $x^2 + bx + c$, including the difference of two squares	
	use and interpret algebraic notation, including: ab in place of a × b, 3y in place of y + y + y and 3 × y, a^2 in place of a × a, a^3 in place of a × a × a, a/b in place of a ÷ b, brackets	use and interpret algebraic notation, including: a^2b in place of a × a × b, coefficients written as fractions rather than as decimals	simplify and manipulate algebraic expressions by expanding products of two binomials and factorising quadratic expressions of the form $x^2 + bx + c$	simplify and manipulate algebraic expressions involving algebraic fractions	simplify and manipulate algebraic expressions (including those involving surds and algebraic fractions) by expanding products of two or more binomials
	simplify and manipulate algebraic expressions by collecting like terms and multiplying a single term over a bracket	simplify and manipulate algebraic expressions by taking out common factors and simplifying expressions involving sums, products and powers, including the laws of indices	argue mathematically to show algebraic expressions are equivalent, and use algebra to support and construct arguments	manipulate algebraic expressions by expanding products of more than two binomials	manipulate algebraic expressions by factorising quadratic expressions of the form $ax^2 + bx + c$

Solving equations

Stage 6	Stage 7	Stage 8/Foundation	Stage 9/FH	Stage 10/Higher	Stage 11/Higher+
express missing number problems algebraically	solve linear equations in one unknown algebraically	solve linear equations with the unknown on both sides of the equation	solve, in simple cases, two linear simultaneous equations in two variables algebraically / represent the solution set to an inequality on a number line	solve, in simple cases, two linear simultaneous equations in two variables algebraically / solve two simultaneous equations in two variables where one is quadratic algebraically	solve quadratic equations by completing the square and by using the quadratic formula
find pairs of numbers that satisfy an equation with two unknowns			solve quadratic equations algebraically by factorising / find approximate solutions to simultaneous equations using a graph	find approximate solutions to equations numerically using iteration / solve quadratic equations (including those that require rearrangement) algebraically by factorising	
	use the symbols =, ≠, <, >, ≤, ≥	find approximate solutions to linear equations using a graph	find approximate solutions to quadratic equations using a graph / solve linear inequalities in one variable		solve quadratic inequalities in one variable
enumerate possibilities of combinations of two variables			derive an equation (or two simultaneous equations), solve the equation(s) and interpret the solution	solve linear inequalities in two variables / represent the solution set to an inequality using set notation and on a graph	

Formulae

Stage 6	Stage 7	Stage 8/Foundation	Stage 9/FH
use simple formulae	substitute numerical values into formulae and expressions	substitute numerical values into scientific formulae	translate simple situations or procedures into algebraic expressions or formulae
recognise when it is possible to use formula for area and volume of shapes	understand and use standard mathematical formulae	rearrange formulae to change the subject	

Sequences

Stage 6	Stage 7	Stage 8/Foundation	Stage 9/FH	Stage 10/Higher	Stage 11/Higher+
generate and describe linear number sequences	generate terms of a sequence from a term-to-term rule	generate terms of a sequence from either a term-to-term or a position-to-term rule	recognise and use Fibonacci type sequences, quadratic sequences	deduce expressions to calculate the nth term of **quadratic sequences**	recognise and use simple geometric progressions (r^n where n is an integer, and r is a rational number > 0 **or a surd) and other sequences**
	recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions			recognise and use simple geometric progressions (r^n where n is an integer, and r is a rational number > 0)	

Representing graphically

Stage 6	Stage 7	Stage 8/Foundation	Stage 9/FH	Stage 10/Higher	Stage 11/Higher+
describe positions on the full coordinate grid (all four quadrants)	work with coordinates in all four quadrants	plot graphs of equations that correspond to straight-line graphs in the coordinate plane / identify and interpret gradients and intercepts of linear functions graphically	use the form y = mx + c to identify parallel lines / find the equation of the line through two given points, or through one point with a given gradient	use the form y = mx + c to identify perpendicular lines / identify and interpret roots, intercepts, turning points of quadratic functions graphically	solve, in simple cases, two linear simultaneous equations in two variables algebraically / represent the solution set to an inequality on a number line
			identify and interpret gradients and intercepts of linear functions algebraically / recognise, sketch and interpret graphs of quadratic functions	deduce roots of quadratic functions algebraically / interpret the reverse process as the 'inverse function'	solve quadratic equations algebraically by factorising / find approximate solutions to simultaneous equations using a graph
	understand and use lines parallel to the axes, y=x and y=-x	recognise, sketch and interpret graphs of linear functions and simple quadratic functions / plot and interpret graphs and graphs of non-standard (piece-wise linear) functions in real contexts, to find approximate solutions to problems such as simple kinematic problems involving distance and speed	recognise, sketch and interpret graphs of simple cubic functions and the reciprocal function y = 1/x with x ≠ 0 / interpret the gradient of a straight line graph as a rate of change;	plot and interpret graphs to find approximate solutions to problems such as simple kinematic problems / interpret the gradient at a point on a curve as the instantaneous rate of change	find approximate solutions to quadratic equations using a graph / solve linear inequalities in one variable
			plot and interpret graphs (including reciprocal graphs) and graphs of non-standard functions in real contexts, to find approximate solutions to problems such as simple kinematic problems involving distance, speed and acceleration	recognise and use the equation of a circle with centre at the origin / find the equation of a tangent to a circle at a given point	derive an equation (or two simultaneous equations), solve the equation(s) and interpret the solution
				calculate or estimate gradients of graphs and areas under graphs (including quadratic and other non-linear graphs	

Algebra