

Pure Topics	Year 1	Year 2	GCSE	AQA GCSE Further
<b>Algebra</b>				
Expanding brackets and simplifying expressions			GCSE	AQA Further
Factorising (4 main types – common , difference of 2 squares, product sum and AC method)			GCSE	AQA Further
Simultaneous Equations (linear and quadratic)			GCSE	AQA Further
Completing The Square			GCSE	AQA Further
Solving and Forming Quadratics			GCSE	AQA Further
Surds			GCSE	AQA Further
Linear and Quadratic Modelling				AQA Further
Solving Inequalities (linear and quadratic)			GCSE	AQA Further
Solving Inequalities (rational)				AQA Further
Indices			GCSE	AQA Further
Algebraic Fractions			GCSE	AQA Further
Discriminant (including hidden discriminant)				AQA Further
Binomial Expansion (integers powers)				AQA Further
Binomial Expansion (fractional and negative powers)				
Polynomial Division				AQA Further
Factor theorem				AQA Further
Remainder Theorem				
Partial Fractions				
<b>Geometry</b>				
Volume and surface area of 3D shapes (assumed knowledge)			GCSE	AQA Further
Straight Line Graphs (including parallel and perpendicular lines)			GCSE	AQA Further
Tangent to a circle			GCSE	AQA Further
Circles (equation of a circle)				AQA Further
<b>Trigonometry</b>				
Bearings			GCSE	AQA Further
Radians				
Arc Lengths And Areas Of Sectors				
Given The Value Of One Trig Function, Find Another				AQA Further
Sine/Cosine Rule			GCSE	AQA Further
Identities and solving with $\sin^2 x + \cos^2 x = 1$ and $\tan x = \frac{\sin x}{\cos x}$				AQA Further
Pythagoras, SOHCAHTOA and 3D trig (assumed knowledge)			GCSE	AQA Further
Trig graphs (sin, cos and tan)				AQA Further
Identities and solving with $1 + \tan^2 x = \sec^2 x$ and $1 + \cot^2 x = \operatorname{cosec}^2 x$				
Identities and solving with reciprocal functions: $\sec x = \frac{1}{\cos x}$ , $\operatorname{cosec} x = \frac{1}{\sin x}$ , $\cot x = \frac{1}{\tan x}$				
Identities and solving with double angle formulae				
Identities and solving with addition angle formulae				
Identities and solving with $a \sin x \pm b \cos x$ or $a \cos x \pm b \sin x$ forms				
Small Angle Approximations				
Inverse Trig – finding values				
Trig graphs – reciprocal and inverse trig				
Trigonometric Models				
<b>Exponentials and Logs</b>				
Simplifying Expressions				
Solving Logarithmic Equations				
Solving Natural Logarithmic Equations				
Solving exponential equations				
Linear transformations				
Exponential Models				
<b>Proofs</b>				
Counter Example				
Deduction				AQA Further
Exhaustion				
Contradiction				
<b>Differentiation</b>				
Note: for parametric differentiation see parametric equations section				
$y = x^n$ differentiation technique			iGCSE	AQA Further
Understanding differentiation as a connected rates of change and small increments				AQA Further
Differentiation by 1 <sup>st</sup> principles – $x^n$ types				
Differentiation by 1 <sup>st</sup> principles – trig functions				
Finding gradients			iGCSE only	AQA Further
Stationary points (max/min)			iGCSE only	AQA Further
Points of Inflection				
Increasing/Decreasing				
Convex/Concave				
Tangents and Normals (finding equations + other applications)				AQA Further
$f \leftrightarrow f' \leftrightarrow f''$ graphs				

Optimisation			IGCSE only	
Differentiating $x$ in terms of $y$ and getting answer in terms of $x$				
Composite functions differentiation techniques – chain rule ( $(f(x))^n, \ln f(x), e^{f(x)}, a^{f(x)}, \sin f(x)$ etc)				Cambridge Only
Product and Quotient Rule				Edexcel and Cambridge
Implicit Differentiation				
Rates of Change/Related Rates				
<b>Integration</b>				
<b>Note: for parametric integration see parametric equations section</b>				
$\int x^n$ Integration Technique				
Finding area under a curve				
Composite functions integration techniques ( $(f(x))^n, \frac{1}{f(x)}, e^{f(x)}, \sin f(x)$ etc)				
Integration by Parts				
Integration by Substitution				
Trapezium Rule				
Riemann Sums				
Differential Equations				
<b>Sequences and Series</b>				
Arithmetic Series				
Geometric Series				
Sigma Notation				
Recursive Sequences				
<b>Functions</b>				
Types of functions (one to one, many to one)				
Basics (notation, composite etc)			GCSE	AQA Further
Finding inverses and knowing when they exist			GCSE	AQA Further
Modulus (solving equalities and inequalities)				
<b>Graphing</b>				
Basic graphs (linear, quadratic, cubic, rational exponential, log and trig)			GCSE	AQA Further
Basic graphs (quartic and root)				
More advanced graphs (modulus, reciprocal trig and inverse trig)				
Graphing a modulus graph without being given the equation				
Transformations			GCSE	AQA Further
Finding points of intersection and intercepts			GCSE	
Finding a polynomial equation when given a graph			IGCSE	
Solving graphically			GCSE	
Domain and Range				AQA Further
<b>Numerical Methods</b>				
Iteration			GCSE	
Newton Raphson				
<b>Parametric Equations</b>				
Sketching				
Domain & range				
Finding Points of intersection				
Differentiation				
Integration				
Finding Areas				
Modelling				
<b>Vectors</b>				
2D			GCSE	
3D				
Geometric Problem Solving Types			GCSE	