

Cambridge Vs OCR Vs Edexcel Vs AQA Maths Topic Checklist

Order of difficulty from greatest to least: Cambridge iGCSE Additional, OCR GCSE Additional, Edexcel iGCSE Further, AQA GCSE Further

Cambridge iGCSE: 2 or 3 papers depending on the specification chosen (always one of them is non calculator)

OCR GCSE: 1 paper (calculator)

Edexcel iGCSE: 2 papers (both calculator)

AQA GCSE: 2 papers (one calculator, one non calculator)

Topics	AQA Further GCSE	Edexcel Further iGCSE	OCR Additional GCSE	Cambridge Additional iGCSE
Number				
Product Rule for Counting				
Algebra				
Expanding brackets and collecting like terms				
Factorising (common factor, product sum, AC method, grouping, diff of 2 squares)				
Completing the square				
Indices				
Surds				
Solving linear equations				
Solving quadratic equations (via factorising, quadratic formula and completing the square)				
Simultaneous equations (linear and quadratic) - 2 unknowns (algebraic and graphical solutions)				
Simultaneous equations (linear) - 3 unknowns				
Forming equations – linear and quadratic				
Forming equations – Cubic				
Solving inequalities – linear				
Solving inequalities - quadratic				
Graphs of linear inequalities (shading)				
Binomial expansion				
Algebraic fractions				
Re-arranging equations to make the subject				
Factor theorem				
Remainder theorem				
Polynomial division				
Solving cubics				
Algebraic Proof				
nth term of linear sequences				
nth term of quadratic sequences				
Sequences – nth term and limiting value				
Recurrence relationships				
Discriminant				
Functions				
Functions – basics				
Functions – composite and inverse				
Functions – Knowing when an inverse exists				
Functions – domain and range				
Function definitions – one to one, many to one etc				
Modulus – solving equalities, inequalities, graphs and $f(x)$, $ f(x) $ notation				
Graphing				
Sketching functions – linear, quadratic, cubic, rational				
Sketching functions – exponential				
Sketching functions – trig				
Sketching functions – piecewise				
Basic graphs (modulus and inverse trig)				
Graphing a modulus graph without being given the equation				
Exponentials and Logarithms				
Exponential and log graphs				
Log rules/properties (index, multiplication, division, power and change of base)				
Converting an exponential to a linear form				
Solving exponentials				
Modelling – growth and decay				
Series				
Σ notation				
Arithmetic and geometric series				

Coordinate Geometry – Straight Line Graphs

Gradients				
Midpoints				
Distance between two points				
Use ratio to find the coordinates of a point on a line given the coordinates of 2 other points				
Equation of a straight line (drawing and finding the equation)				
Parallel and perpendicular lines				
Circles (equation of a circle)				
Equation of a tangent to a circle				
Linear programming – forming inequalities and shading in order to optimise + applications)				

Calculus

Basic differentiation of kx^n where n is any integer				
Rates of change and connected rates of change understanding				
Equations of tangents and normals				
Stationary/turning points				
Classifying maximum and minimum				
Sketching a curve based on max and min points				
Differentiation of polynomials, trig and exponentials $x^n, \frac{1}{x}, \sin ax, \cos ax, e^{ax}$				
Product and quotient rule				
Increasing/decreasing functions				
Second derivative				
Kinematics				
Basic integration				
Integration of polynomials, trig and exponentials $x^n, \sin ax, \cos ax, e^{ax}$)				
Definite versus indefinite integrals				
Area under curve and between two curves				
Composite functions differentiation techniques ($f(x)^n, \ln f(x), e^{f(x)}, af(x), \sin f(x)$ etc)				
Composite functions integration techniques ($f(x)^n, \frac{1}{f(x)}, e^{f(x)}, \sin f(x)$ etc)				

Scalar and vector quantities

Addition and subtraction of vectors				
Comparing components of vectors				
Magnitude of a vector				
Position vector				
Unit vector				
Geometry - parallel lines and collinearity				

Matrix Transformations (2x2 or 2x1 matrices)

Multiplying matrices				
Identity matrix				
Transformation matrices				

Trigonometry

Surface area and volume of prisms, cylinders, sphere, cones and pyramids (assumed)				
Sine and cosine rule				
Sine Rule - ambiguous case				
Area of any triangle				
Pythagoras and SOHCAHTOA in 2D and 3D				
Trig graphs				
Trig identities - $\sin^2 x + \cos^2 x = 1, \tan x = \frac{\sin x}{\cos x}$				
Trig identities - $\sin(a \pm b), \cos(a \pm b), \tan(a \pm b)$				
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: $\sec x = \frac{1}{\cos x}, \operatorname{cosec} x = \frac{1}{\sin x}, \cot x = \frac{1}{\tan x}$				
Trig - special angles				
Finding values of sin, cos and tan for any angle				
Given value of one trig function, find the value of another trig function				
Angles between a line and a plane and between 2 planes				
Solving trig equations				
Radians				
Arc length and Area of a sector				

Probability

Tree diagrams				
Venn diagrams				
Two-way tables				
Permutations				
Combinations				

Numerical Methods

Iteration and change of sign to solve equations				
Gradients of tangents to a curve				
Using rectangles and trapezia to estimate the area under a curve (including over and under estimate knowledge)				