Cambridge Vs OCR Additional 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 (one paper is always non calculator)
OCR GCSE: 1 paper (calculator)
Edexcel iGCSE: 2 papers (both calculator)
AQA GCSE: 2 papers (one calculator, one non calculator)

Topics	OCR Additional GCSE	Cambridge Additional iGCSE
Product Rule for Counting	■	
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)	■	■
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	■	■
Recurrence relationships	■	
Discriminant		■
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		■
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		■
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	■	
Arithmetic and geometric series		■
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)	■	
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	■	■

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Topic		
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		
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 $(f(x))^n, lnf(x), e^{f(x)}, a^{f(x)}, sinf(x)$ etc)		
Composite functions integration techniques ($(f(x))^n, \frac{1}{f(x)}, e^{f(x)}, sinf(x)$ etc)		
Addition and subtraction of vectors		
Comparing components of vectors		
Magnitude of a vector		
Position vector		
Unit vector		
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 - $sin^2 x + \cos^2 x = 1, \tan x = \frac{\sin x}{\cos x}$		
Identities and solving with $1 + \tan^2 x = \sec^2 x$ and $1 + \cot^2 x = cosec^2 x$		
Identities and solving with reciprocal functions: $\sec x = \frac{1}{\cos x}, cosec x = \frac{1}{\sec x}, \cot x = \frac{1}{\tan x}$		
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		
Solving trig equations		
Radians		
Arc length and Area of a sector		
Tree diagrams		
Venn diagrams		
Two-way tables		
Permutations		
Combinations		
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)		