



IGCSE Additional Mathematics 0606

Curriculum Content

Cambridge IGCSE Additional Mathematics is accepted by universities and employers as proof of essential mathematical knowledge and ability. The Additional Mathematics syllabus is intended for high ability students who have achieved, or are likely to achieve, Grade A*, A or B in the Cambridge IGCSE Mathematics examination. Successful Cambridge IGCSE Additional Mathematics students gain lifelong skills, including:

- Further development of mathematical concepts and principles
- Extension of mathematical skills and their use in more advanced techniques
- Ability to solve problems, present solutions logically and interpret results
- Solid foundation for further study

We recommend that students who are beginning this course should be currently studying or have previously studied Cambridge IGCSE Mathematics 0580.

The aim of this subject is to enable students to:

- consolidate and extend their elementary mathematical skills, and use these in the context of more advanced techniques
- further develop their knowledge of mathematical concepts and principles, and use this knowledge for problem solving
- appreciate the interconnectedness of mathematical knowledge
- acquire a suitable foundation in mathematics for further study in the subject or in mathematics related subjects
- devise mathematical arguments and use and present them precisely and logically
- integrate information technology (IT) to enhance the mathematical experience
- develop the confidence to apply their mathematical skills and knowledge in appropriate situations
- develop creativity and perseverance in the approach to problem solving
- derive enjoyment and satisfaction from engaging in mathematical pursuits, and gain an appreciation of the beauty, power and usefulness of mathematics

Affiliations





Topic	Content
Sets and Venn Diagrams	Sets, Interval notation, Relations, Complements of sets, Properties of union and intersection, Venn diagrams, Numbers in regions, Problem solving with Venn diagrams
Functions	Relations and functions, Function notation, Domain and range, The modulus function, Composite functions, Sign diagrams, Inverse functions
Quadratics	Quadratic equations, Quadratic inequalities, The discriminant of a quadratic, Quadratic functions, Finding a quadratic from its graph, Where functions meet, Problem solving with quadratics, Quadratic optimization
Surds, indices and exponentials	Surds, Indices, Index laws, Rational indices, Algebraic expansion and factorization, Exponential equations, Exponential functions, The natural exponential e^x ,
Logarithms	Logarithms in base 10, Logarithms in base a, Laws of logarithms, Logarithmic equations, Natural logarithms, Solving exponential equations using logarithms, The change of base rule, Graphs of logarithmic functions
Polynomials	Real polynomials, Zeros, roots, and factors, The Remainder theorem, The Factor theorem, Cubic equations
Straight line graphs	Equations of straight lines, Intersection of straight lines, Intersection of a straight line and a curve, Transforming relationships to straight line form, Finding relationships from data
The unit circle and radian measure	Radian measure, Arc length and sector area, The unit circle and the trigonometric ratios, Applications of the unit circle, Multiples of $\pi/6$ and $\pi/4$, Reciprocal trigonometric ratios
Trigonometric functions	Periodic behavior, The sine function, The cosine function, The tangent function, Trigonometric equations, Trigonometric relationships, Trigonometric equations in quadratic form



Topic	Content
Counting and the binomial expansion	The product principle, Counting paths, Factorial notation, Permutations, Combinations, Binomial expansions, The Binomial Theorem
Vectors	Vectors and scalars, The magnitude of a vector, Operations with plane vectors, The vector between two points, Parallelism, Problems involving vector operations, Lines, Constant velocity problems
Matrices	Matrix structure, Matrix operations and definitions, Matrix multiplication, The inverse of a 2×2 matrix, Simultaneous linear equations,
Introduction to differential calculus	Limits, Rates of change, The derivative function, Differentiation from first principles, Simple rules of differentiation, The chain rule, The product rule, The quotient rule, Derivatives of exponential functions, Derivatives of logarithmic functions, Derivatives of trigonometric functions, Second derivatives
Application of differential calculus	Tangents and normals, Stationary points, Kinematics, Rates of change, Optimisation, Related rates
Integration	The area under a curve, Antidifferentiation, The fundamental theorem of calculus, Integration, Rules for integration, Integrating $f(ax+b)$, Definite integrals
Application of Integration	The area under a curve, The area between two functions, Kinematics



Assessment

Cambridge IGCSE Additional Mathematics students are awarded grades ranging from A* to E. Since there is no Core Curriculum for this syllabus, Grades F and G will not be available. Therefore, students who do not achieve the minimum mark for Grade E will be unclassified.

All students must take **two** papers.

All Students Must Take:
Paper 1 (2 hours) 10–12 questions of various lengths No choice of question 80 marks
Paper 2 (2 hours) 10–12 questions of various lengths No choice of question 80 marks

Affiliations

