

# LEVEL 2 ADDITIONAL MATHEMATICS

In [Level 2 Additional Mathematics](#), you will build on skills and concepts you have developed in your prior study of mathematics. You will strengthen your use of mathematical techniques, use algebraic skills more confidently, and learn formal methods of mathematical proof; you will be introduced to calculus and some of its applications. You will study one of four optional units that introduce areas of mathematics that are new to you or that explore more deeply topics you have previously studied.

## WHAT WILL I STUDY?

You will study two mandatory units and one optional unit.

### Mandatory units:

**UNIT 1: Algebra** - You will become proficient in numerical and algebraic manipulation. You will delve further into quadratic functions than you have done previously, using the properties of a quadratic function to sketch its shape and identify its roots, if it has them; you will solve simultaneous quadratic equations. You will learn about sequences and series and use your new skills and knowledge to solve problems and formulate proofs.

**UNIT 2: Calculus** - This unit introduces differential calculus - the mathematics of rates of change, gradients and slopes, and integral calculus - the mathematics of summation and areas. You will learn how to find exact gradients at points on some curved graphs, and exact areas under some curved graphs - quantities that previously you could only estimate.

### Optional units:

**UNIT 3: Geometry and Trigonometry** - This unit covers properties of straight lines and circles and the conditions for different relationships between them, such as whether lines are parallel, perpendicular or neither, whether lines and circles intersect. You will study graphs of trigonometric functions, solve trigonometric equations, and manipulate trigonometric identities to prove interesting results.

**UNIT 4: Statistics** - You will broaden your knowledge of statistical techniques and representation of data. You will compare data sets using suitable measures and learn how to reach justifiable conclusion. You will extend your knowledge of probability to use different probability laws and to make calculations from probability distributions.

**Unit 5: Mechanics** - You will study different types of forces, their characteristics and their effects on objects. You will understand the difference between a balanced and an unbalanced system and apply Newton's laws to solve problems involving forces and motion. You will study the motion of particles under constant acceleration.

**Unit 6: Discrete and Decision Mathematics** - This unit introduces the mathematics of decision-making, logic and optimisation. You will learn about networks, algorithms, critical path analysis and linear programming and how they can be used to identify optimal solutions such as routes through a network, ordering of tasks, maximising profits or minimising costs.

## HOW WILL I BE ASSESSED?

UNIT 1: Algebra	
Written examination - no calculator	
50 minutes	40 marks
Weighting: 33% of the qualification	

UNIT 2: Calculus	
Written examination - calculator allowed	
50 minutes	40 marks
Weighting: 33% of the qualification	

Optional unit	
Written examination - calculator allowed	
50 minutes	40 marks
Weighting: 33% of the qualification	

## WHAT SKILLS WILL I DEVELOP?

- You will develop a deeper understanding of some of the mathematics you have previously studied and learn about new areas of mathematics.
- You will extend your range of mathematical skills and techniques and be able to use and apply them in theoretical and real-life contexts.
- You will identify and use the relationships between the different areas of mathematics studied
- You will gain a strong foundation in the mathematics you need for potential further study in a variety of STEM subjects.

## CAREERS IN MATHEMATICS

Level 2 Additional Mathematics builds the skills needed to follow a number of career paths in mathematics and many other areas, such as sciences and social sciences. The skills of analysis and critical thinking developed through studying this course are transferable across many sectors.

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