

MATHEMATICS Advanced Level

Qualification Level 3 Advanced GCE in Mathematics

Exam Board AQA

Course Specific Entry Requirements Grade 6 or above in GCSE Mathematics. (Students with a Grade 6 will find the transition to A Level Mathematics difficult and should expect a significant additional workload)

Overview

Advanced Level Mathematics develops the mathematical concepts you will have learned at GCSE level whilst enriching your understanding of how mathematics can be applied to realistic situations. It emphasises how mathematical ideas are interconnected and how mathematics can be applied to model situations using algebra and other representations, to help make sense of data, to understand the physical world and to solve problems in a variety of contexts, including social sciences and business. Advanced Level Mathematics prepares students for further study and employment in a wide range of disciplines involving the use of mathematics as well as supporting your mathematical needs across a broad range of other subjects at this level. The A Level course is assessed through three equally-weighted written papers:

- ▲ **Paper 1:** Pure Mathematics
- ▲ **Paper 2:** Pure Mathematics and Mechanics
- ▲ **Paper 3:** Pure Mathematics and Statistics

All exam papers are calculator based, and you will need to obtain a graphical calculator at the start of the course.

What will I learn?

Advanced Level Mathematics has three over-arching themes

- ▲ Mathematical argument and proof
- ▲ Mathematical problem-solving
- ▲ Mathematical modeling

It is divided into three branches:

- ▲ **Pure Mathematics:** proof ▲ algebra and functions ▲ coordinate geometry ▲ sequences and series ▲ trigonometry ▲ exponentials and logarithms ▲ calculus ▲ numerical methods for solving equations ▲ vectors
- ▲ **Statistics:** statistical sampling ▲ data presentation and interpretation ▲ probability ▲ statistical distributions ▲ statistical hypothesis testing
- ▲ **Mechanics:** quantities and units ▲ kinematics ▲ forces ▲ Newton's laws ▲ moments

How will I learn?

During lessons, you will be encouraged to discuss and evaluate mathematical concepts, sometimes in small groups, sometimes as a whole class. Your studies will take an investigative approach to develop your reasoning and problem-solving skills. You will also be expected to take notes and practise key concepts in class. Some topics will be taught using graphical calculators and computers. Advanced Level Mathematics requires a lot of dedication; you will be required to practise the skills you have learned in class with extensive work at home and during your study periods in College. Help and support from your mathematics teachers will be available after College and during lunch times.

Where could it lead?

Mathematics is a versatile qualification, well-respected by employers and is regarded as a 'facilitating' subject for entry to Higher Education by the Russell Group of Universities. Careers for people with good mathematics skills and qualifications are not only well paid – recent research suggests that those who have a Maths A Level earn an average 10% higher income – but they are also interesting and rewarding. Mathematics can lead to a variety of fulfilling careers from engineering, design and architecture to philosophy, geography and even careers in music and media.