MATHEMATICS

OCR Mathematics AS Level - H230
OCR Mathematics A Level - H240

CAREER POSSIBILITIES

A Level mathematics complements and supports many other subjects at A Level including sciences, social sciences, geography and economics, or you may choose to study it simply because you enjoy it. Students at Carmel who have studied A Level mathematics have gone on to study a wide variety of undergraduate courses ranging from fashion buying to illustration, as well as more traditional subjects such as engineering, medicine and law. Research has shown that students who have studied A Level Mathematics have gone on to earn 10% more than those who didn't.

The Programme

The course provides a broad and widely applicable base of mathematical knowledge, including rigorous treatment of calculus and proof alongside statistics and mechanics, preparing learners for a wide range of destinations in higher education and employment. All aspects of the course are compulsory. It emphasises how mathematical ideas are interconnected and how mathematics can be applied to model situations mathematically, 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.

The mechanics element of the course strongly supports students studying physics. A new feature of A Level maths will be to use a large data set of pre-released material, which will be used throughout the course. It will be necessary for students to purchase a new calculator with specific functions that will allow them to work with real data and explore it with appropriate technology. We would strongly recommend students to wait before beginning the course when they will be advised on which calculator to purchase. Students will find A Level lessons similar to those at GCSE, with the teacher introducing a topic and demonstrating how to solve problems with students contributing to solutions. Regular homework is set to allow students to practise and consolidate their learning. AS exams will be taken at the end of Year 12 before we embark on the A2 course for those who wish to continue studying mathematics in Year 13.

WHY STUDY THIS SUBJECT?

If you enjoy Mathematics and are confident with the work you have met so far at GCSE, A Level Mathematics could be the course for you. Students enjoy its challenge, its clarity and the fact that you know when you are right. The solution of a problem has an excitement and a satisfaction. Mathematics is good training for the mind, helping to develop logical thinking and problem-solving skills – the kind of analytical processes that have helped solve problems of all kinds for thousands of years. It is a demanding and challenging subject but it can be an extremely rewarding one if you are prepared to put in time and effort. Mathematics is classed by the Russell Group Universities as a facilitating subject for Maths and Science-based degree courses.

MATHEMATICS (FURTHER)

OCR Further Mathematics AS - H235
OCR Further Mathematics A Level - H245

CAREER POSSIBILITIES

University and future employers are able to distinguish students who have studied Further Mathematics as able mathematicians in their applications for courses and jobs. Students at Carmel who have studied A Level Further Mathematics have gone on to study a wide variety of undergraduate courses ranging from medicine and music, to more typical subjects such as mathematics, physics and engineering. Students have also gone on to train as accountants in local firms.

The Programme

Further Mathematics is a second A Level in Mathematics which can only be studied if A Level Mathematics is also being studied. Further Mathematics both extends and deepens your knowledge and understanding beyond the standard A Level Mathematics. Students will study different areas of pure mathematics, mechanics and statistics than in A Level Mathematics. Students will broaden their knowledge into other areas of pure mathematics, that underpin further study, with complex numbers, matrices, polar coordinates and hyperbolic functions. In statistics, content includes combinatorics, probability distributions for discrete and continuous random variables, hypothesis tests and confidence intervals for a population mean, squared tests, non-parametric tests, correlation and regression. In mechanics, students use their extended pure mathematical knowledge to explore more complex physical systems. The area covers dimensional analysis, work, energy, power, impulse, momentum, centres of mass, circular motion and variable force.

Students gain two A Levels, one in Mathematics and one in Further Mathematics and consequently have twice as many maths lessons as A Level maths students. Students will take AS exams in Further Mathematics at the end of Year 12, alongside AS exams in Mathematics, before continuing with the A2 Further Mathematics course if they wish. We have had a number of students in previous years who have studied Further Mathematics to AS level only.

WHY STUDY THIS SUBJECT?

Further Mathematics is an ideal subject for the most academic students who wish to immerse themselves in maths. Students who take Further Mathematics are generally students who can master the more demanding concepts in GCSE mathematics quickly and easily. Students who take Further Mathematics find that the additional time spent studying mathematics boosts their marks in A Level Mathematics. It makes the transition from VI Form to university courses, which are mathematically rich, that much easier as much of the first year course content will be familiar. If you are planning to take a degree such as Engineering, Sciences, Computing, Finance, Economics, etc., or perhaps Mathematics itself, at the more selective universities, you will benefit enormously from taking Further Mathematics, at least to AS level.

AS Further Mathematics introduces new topics such as matrices and complex numbers that are vital in many STEM degrees. Students who have studied Further Mathematics find the transition to such degrees far more straightforward.