

# Mathematics & Further Mathematics

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**Awarding Body: OCR Mathematics A**

**Specification: H240**

Mathematics at A Level is a course worth studying, not only as a supporting subject for the physical and social sciences but also in its own right. It is challenging but interesting and as well as building on the work that you will have already met at IGCSE, new topics will also be introduced. The course is composed of aspects of Pure Mathematics, Mechanics and Statistics. In the Pure Mathematics you will extend your algebraic, trigonometric and calculus (differentiating) skills, as well as meeting new topics including logarithms, exponential functions, binomial expansions, radians and integration (the inverse of differentiating). The Statistics includes using familiar and new techniques in analysing large data sets, hypothesis testing and work on probability. The Mechanics involves working with vectors and deals with the effects of forces on the motion of particles and on larger objects.

The examination consists of three 2 hour papers:

- Pure Mathematics
- Pure and Statistics
- Pure and Mechanics

Mathematics is not an easy option and you will need to have achieved at least a grade 7 (preferably an 8 or 9) at IGCSE, to enable you to access the course. You need to be able to work independently and be able to persevere with problems to a satisfactory conclusion.

You will probably be taught by two teachers, both teaching the Pure Mathematics, with one then concentrating on the Statistics and the other covering the Mechanics.

**Whilst studying Mathematics you will be expected to:-**

- Use mathematical skills, knowledge, argument and logic to solve quite complicated problems. This may include techniques of proof.
- Simplify real-life situations (modelling) so that you can use Mathematics to show what is happening and what might happen in different circumstances
- Use a calculator effectively and appropriately; understand calculator limitations and when it is inappropriate to use such technology. You will need a suitable calculator, which includes statistical and distribution functions. We would recommend the Casio Classwiz FX-991EX. Alternatively you could choose a graphical calculator, such as the Casio fx-CG50

**Higher education courses or careers that either require A Level Mathematics or are strongly related include:**

- Economics (often required)
- Medicine
- Architecture
- Engineering
- Accountancy (often required)
- Actuarial Profession
- Psychology
- Environmental Studies
- Computing (often required).

### **Preparatory work for studying Mathematics in the Sixth Form**



During the summer between IGCSE and A level we would advise you to work through the booklet “Bridging the Gap” which we can provide and which consolidates the work on algebra, trigonometry and graphs from IGCSE, enabling you to make a smooth transition to the A level work.

## Further Mathematics

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**Awarding body: OCR Further Mathematics A**

**Specification: H245**

Further Mathematics is an A Level in its own right, but you must also study Mathematics A Level to do this course. It is more challenging than the Mathematics A Level, but again covers more advanced topics in Pure Mathematics, including matrices, complex numbers and further techniques in calculus. The Mechanics extends to include momentum and collisions, circular motion and centres of mass and the Statistics includes permutations and combinations, correlation and regression lines and further statistical distributions.

There are many university courses for which Further Mathematics would be helpful, but at present no course makes it a requirement. However, some universities will give reduced offers for Engineering, Mathematics and Physics if you are studying Further Mathematics. In fact it would be considered very difficult to get into a top university (Oxbridge, London, Warwick, etc.) in these subjects, without some qualification in Further Mathematics.

The examination consists of four 90 minute papers:

- Pure Core 1
- Pure Core 2
- 2 options from Statistics, Mechanics, Discrete Mathematics and Additional Pure Mathematics – we normally choose Statistics and Mechanics.

You may have one or two teachers, depending on the timetable.

**Mrs A Knight**