Mathematics A Level at Paston

Awarding Body OCR (MEI)

Mathematics is a fundamental part of our society and its success. It is as old as history! We all know the names of famous mathematicians like Pythagoras from 2600 years ago or Einstein from a century ago. The skills and methods we learn in maths influence the way we tackle and solve problems even though we might not always be aware of it. Maths is more obviously used in specialist areas like modelling weather; economics; accounting or engineering.

All mathematics tries to model the behaviour of the real world through formulas – some of these are exact (as in mechanics) and some are approximate (as in statistics). We can then use these formulas to predict and control our future!

In studying maths you will develop the techniques and skills to manipulate formulas and you will see the application of some of these to real situations.

Mathematics fits well with virtually any other subject, but is particularly useful with the sciences. Many university courses require maths A level, in particular: sciences, engineering and mathematics itself.

At Paston we aim to make you confident and competent in the subject by a variety of enjoyable approaches including group work, investigation, use of computers and calculators and imaginative delivery by a team of highly qualified mathematicians.

AS Mathematics

In AS mathematics you will study Core 1 and 2 for ⅔ of the time

- How to solve quadratic equations and draw them.
- The connection between graphs and algebra.
- Negative and fraction indices.
- How to multiply out expressions like $(a+x)^5$
- Sequences of numbers.
- How to find the gradient and the area under a curve using algebra.
- Trigonometry (sine, cosine and tangents).
- Logarithms.

Together (for ⅓ of the time) with one of:

Mechanics

- The effect of forces on bodies
- Finding distance and speed of a body that is accelerating.
- The study of how a body flies through the air (once you let go!)
- Newton's laws

Decision maths

- Drawing networks to help solve practical decision making.
- How to simulate practical problems using numbers to avoid expensive trials.
- How to organise a number of jobs that need completing for a task
- Finding the shortest distance from one town to another etc.
- How to maximise your profits.
- Systems for solving problems by repeated calculations

Assessment

- Three 1½ hour examinations.

- At least 5 GCSEs at grade A*-C, including mathematics, or the equivalent.
- You will need to have at least a A in maths GCSE and the recommendation of your maths teacher.

In A2 Mathematics you will continue to study pure mathematics for ⅔ of the time and continue with the option you studied at AS or start another one.

Core 3 and 4

- A new special number e and more logarithms.
- Defining and using the algebra of functions.
- Advanced calculus (Gradients and areas etc),
- How to solve an equation when there is not an exact algebraic method.
- Advanced trigonometry.
- Using vectors to work in 3 dimensions.

Statistics:

- Test if two sets of measurements are related.
- Special distributions of natural (random) occurrences
- contingency tables,

Decision Mathematics:

- Using computers to solve complicated sets of equations.
- Using a spreadsheet to simulate practical situations (e.g. queues).
- The algebra of complicated sequences like Fibonnacci.

Mechanics:

- The connection between work, power and energy when objects move.
- How bodies react when they collide
- Finding the centre of mass (gravity) of objects.
- The forces in frameworks.

Assessment

- Three 1½ hour examinations.
- One piece of coursework (20% of C3)
- 1 hour “Comprehension” exam (20% of C4)

Entry Requirements

We will expect you to have achieved at least a grade D at AS in this subject