



# A Level Maths

## Why study MATHEMATICS?

Mathematics has served humanity in our quest to understand the world and extend the possibilities that this ever changing world can offer. Mathematics underpins the atomic fabric of the universe; the principles and patterns of numbers and laws of geometry allow us to search for meaning in the universe with greater precision.

Studying A level Mathematics will raise your confidence to tackle and solve increasingly complex abstract and real-life problems. Mathematics helps you develop your abilities to be creative, think with clarity and reason logically. Employers and universities value the skills and knowledge acquired through an A level in mathematics and research has shown that students who have studied A Level Maths go on to earn around 10% more than students who have not studied the subject.

## What is the course structure?

### Exam Board: Edexcel

#### A Level

Three exams papers are taken for an award in A level Mathematics. Papers 1 and 2 assess pure Mathematics while paper 3 assesses Statistics and Mechanics. All examination papers are equally weighted and last 2 hours. Calculator usage is allowed in all three papers.

#### Overview of content of A level papers:

##### Paper 1

Proof; Algebra and functions; coordinate geometry in the  $(x,y)$  plane; sequences and series; trigonometry; exponentials and logarithms, differentiation; integration; vectors.

##### Paper 2

The topics covered in paper 1 are developed further and numerical methods are introduced.

##### Paper 3

###### Section A: Statistics

Statistical sampling; data presentation and interpretation; probability; statistical distributions; statistical hypothesis testing.

###### Section B: Mechanics

Quantities and units in mechanics; kinematics; forces and Newton's laws; moments.

## Which activities will I be engaged in during the course?

You will enjoy this course if you enjoy your Mathematics and are prepared to work hard. To achieve the higher grades in this course you must be prepared to put in the hours of work. A significant majority of the course is Algebra based; requiring you to be able to work confidently with equations and graphs. As part of your study of Statistics you will be using a large data set provided by the Met office and some questions in section A of paper 3 will involve the analysis of an extract from the data set. The use of technology permeates the study of A Level Mathematics and you are required to have a calculator which includes an iterative function and the ability to compute summary statistics and access probabilities from standard statistical distributions.

The kind of learning habits you might be asked to draw upon include:

- Organising your notes and using effective revision strategies to learn facts, terminology and procedures
- Independently reading up on prior knowledge and new theories
- Self-evaluating your understanding and misconceptions within a topic and taking actions to address any shortfall.
- Thinking and communicating with clarity using subject specific vocabulary.
- Constructing rigorous mathematical arguments (including proofs)
- Questioning, posing problems and investigating new ideas
- Translating problems in mathematical and non-mathematical contexts into mathematical processes.
- Developing creative ways to solve problems by being thoughtful, calm and strategic.

## How can I prepare for the course?

As you already know, to succeed in mathematics you need to be constantly using and building on your existing skills and knowledge. Your GCSE algebra is very important for a successful start to your studies for the pure papers and your GCSE Data Handling will be equally important in paper 3.

It is very important that you do not “forget” the knowledge and understanding you currently possess at the end of year 11. You will find it helpful to keep certain skills fresh in your mind so that you can use them readily at the start of year 12. Induction and the summer break will also provide an excellent opportunity to explore mathematics in more depth, both in terms of wider applications of areas of maths you have met before and also to ‘dip into’ mathematics you will meet at A level.

At your induction days in July, you will be given a booklet full of interesting websites to visit, online links to enrichment resources and key questions to keep your mind fresh. Working on these regularly throughout the summer will ensure that you are well prepared for the challenges of A-level Mathematics.

Further information: Adriana Reeves (Head of Mathematics)