

## **MATHEMATICS (Course Code Ma for Mathematics/Mf for Further Mathematics)**

**Head of Department: Mrs L Walder MA (Cantab)**

Mathematics and its applications are central to many aspects of modern life. It is regarded as a facilitating subject by universities and people who have studied mathematics are in the fortunate position of having an excellent choice of career.

A level Further Mathematics is fun and rewarding. It broadens students' mathematical skills and promotes deeper mathematical thinking. You will be introduced to interesting new areas of pure mathematics such as complex numbers and matrices.

The school follows the new specifications of the EDEXCEL Board (starting teaching in 2017). All assessments are now linear, with 100% examination. AS and A level are now separate qualifications and an AS qualification does not count towards an A level.

### **Course entry requirements**

Pupils must have achieved a grade 7 or above at GCSE Maths before embarking on the A level course, and a grade 8 or above if they wish to study Further Maths.

### **A level Maths (Course Code Ma)**

The mathematics course comprises Pure Maths, Statistics and Mechanics and is studied over two years and examined in Year 13. The content is all compulsory – there is no longer optional content. The table overleaf shows the detail of topics studied.

### **A level Maths and Further Maths (Course Code Mf)**

Students study the entire A level mathematics course comprising Pure Maths, Statistics and Mechanics over one year. At the end of year 12 it is required to get an A\*/A or B in the A2 mathematics examinations in order to progress to further maths in year 13.

The Further mathematics course comprises Further Pure Maths and two options from Further Pure, Statistics, Mechanics and Decision. It is studied and examined in year 13. The table overleaf shows the detail of topics studied.

### **Challenge and Extension Opportunities**

We run a weekly extension maths, (called STEP class) for those wishing to study mathematics at university. This can be attended from year 12 onwards. We undertake longer maths problems in these classes which are very useful preparation for university life. It is also vital preparation for those who are applying to Cambridge, Imperial, Warwick or Bath Universities who include STEP in their offers. Durham additionally has a mathematical aptitude test which can be studied for during the extension class.

All year 12 mathematicians take the Senior Maths Challenge which is an opportunity to showcase their problem solving skills. Many students progress to the follow-on rounds of the kangaroo or Olympiad.

A small team of four students represents the school at the Senior Maths Team Challenge.

**Equipment and Expenses:** Students purchase their own books which cost approximately £20 per textbook. Students taking single maths will need to purchase 2 books over two years. Students taking Further Maths will need to purchase the 2 for maths and an additional 3-4 books depending upon the options they choose. Students need to have a suitable calculator for A level, which may be different to that which they used for GCSE. These cost from £20, but most students purchase a graphical calculator which costs from £50 upwards.

Students generally purchase a pack of practice papers which is £1 per pack.

Trips to enrichment activities are always optional and usually local. Incurred costs relate to transport and are usually minimal as where possible a school minibus is used.

(Nov 2017)

Qualification	Component	Overview	Assessment
A Level Maths	Paper 1 – Pure Maths	Proof Algebra and functions Coordinate geometry in the (x,y) plane Sequences and series Trigonometry Exponentials and logarithms Differentiation Integration Vectors	2 hours 100 marks
	Paper 2 Pure Maths	Proof Algebra and functions Coordinate geometry in the (x,y) plane Sequences and series Trigonometry Differentiation Integration Numerical Methods	2 hours 100 marks
	Paper 3 Statistics and Mechanics	Section A: Statistics Statistical sampling Data presentation and interpretation Probability Statistical distributions Statistical hypothesis Section B: Mechanics Quantities and units in mechanics Kinematics Forces and Newton's laws	2 hours 100 marks

Qualification	Component	Overview	Assessment
A Level Further Maths	Paper 1 Further Pure Maths	Proof Complex numbers Matrices Further algebra and functions Further calculus Further vectors	1.5 hours 75 marks
	Paper 2 Further Pure Maths	Complex numbers Matrices Further algebra and functions Further calculus Polar Coordinates Hyperbolic Functions Differential Equations	1.5 hours 75 marks
	Paper 3 Option 1	One of the following: Further Pure Maths Further Stats Further Mechanics Decision Maths	1.5 hours 75 marks
	Paper 4 Option 2	One of the following: Further Pure Further Stats Further Mechanics Decision Maths	1.5 hours 75 marks

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