

The Osborne Sixth Form

Mathematics



A Level

Specification: <https://qualifications.pearson.com/en/qualifications/edexcel-a-levels/mathematics-2017.html>

Contact: Mrs Payne – l.payne.bch@osborne.coop

Miss R Wickes – r.wickes.scs@osborne.coop or Mr N Rehman – n.rehman.scs@osborne.coop

Why study A Level Mathematics?

A Level Mathematics is very different from GCSE: the course focuses much more on problem solving and understanding why things are happening mathematically. A Level will give students a sense of the true beauty of Mathematics, and a chance to walk in the footsteps of some of the greatest minds. Students will meet strands of Mathematics that they have not had the opportunity to look at previously, including calculus and mechanics. Mathematics is one of the great creations of human intelligence. It is the language of science, technology and engineering. It is essential for architecture and design as well as economics and medicine; even art relies on mathematics to some extent.

What skills will I develop?

Mathematicians will learn to structure their work in a logical way and think about how to break complex problems down into smaller more workable steps. Mathematics will allow students to develop their analytical skills as they work in both the theoretical and the experimental. Modelling mathematical problems adds additional challenge and allows students to consider Mathematics in a wider setting.

What will I study?

Course content Year 12:

Pure Mathematics

Here students will study calculus, trigonometry, sketching and finding the equations of graphs including linear graphs and circles. Students will also look at the roots of equations and what this tells us about a graph. Students will look at the real world links of Mathematics using modelling.

Applied Mathematics

This part of the course is split into Statistics and Mechanics. In statistics students will look at the difference between experimental and theoretical data and how each can be analysed. Students will study a variety of techniques for displaying their results. In Mechanics students will study both constant and variable acceleration and see how these work with a variety of other forces and motions.

Course content Year 13

Pure Mathematics

Students will build on the techniques learnt in the Year 12 course and calculus features heavily here. Students will learn the difference between degrees and radians and why this new measure of angle is important. Students will also develop their knowledge of exponentials and logarithms and see how this links with other units of the course.

Applied Mathematics

The Year 12 work on forces and motion is extended to non-linear motion and forces acting at angles. The normal distribution is introduced to allow students to model more scenarios using probability and carry out hypothesis tests on the sample mean. The exponentials and logarithms work from the pure side of the course is used to be able to create more advanced statistical models for non-linear regression.

How will I be assessed?

Paper 1: Pure Mathematics 1 (*Paper code: 9MA0/01)
Paper 2: Pure Mathematics 2 (*Paper code: 9MA0/02)
<i>Each paper is:</i>
2-hour written examination
33.33% of the qualification
100 marks
Content overview
<ul style="list-style-type: none">• Topic 1 – Proof• Topic 2 – Algebra and functions• Topic 3 – Coordinate geometry in the (x, y) plane• Topic 4 – Sequences and series• Topic 5 – Trigonometry• Topic 6 – Exponentials and logarithms• Topic 7 – Differentiation• Topic 8 – Integration• Topic 9 – Numerical methods• Topic 10 – Vectors
Assessment overview
<ul style="list-style-type: none">• Paper 1 and Paper 2 may contain questions on any topics from the Pure Mathematics content.• Students must answer all questions.• Calculators can be used in the assessment.

Paper 3: Statistics and Mechanics (*Paper code: 9MA0/03)
2-hour written examination
33.33% of the qualification
100 marks
Content overview
Section A: Statistics
<ul style="list-style-type: none">• Topic 1 – Statistical sampling• Topic 2 – Data presentation and interpretation• Topic 3 – Probability• Topic 4 – Statistical distributions• Topic 5 – Statistical hypothesis testing
Section B: Mechanics
<ul style="list-style-type: none">• Topic 6 – Quantities and units in mechanics• Topic 7 – Kinematics• Topic 8 – Forces and Newton's laws• Topic 9 – Moments
Assessment overview
<ul style="list-style-type: none">• Paper 3 will contain questions on topics from the Statistics content in Section A and Mechanics content in Section B.• Students must answer all questions.• Calculators can be used in the assessment.

Where might it lead?

Mathematics can help lead you into a huge variety of careers including Architecture, Medicine, Scientific Research, Engineering, Game Development, Teaching, Business and Finance.

What are the entry requirements?

Grade 6 in Mathematics at GCSE.