Mathematics A-Level Curriculum Overview

Style of Course

The core mathematical elements of the course will develop the skills and techniques necessary to manipulate and solve mathematically formulated problems. These are then applied in statistical and mechanical contexts to draw inferences from data and model real-world situations.
In addition, the Mathematics A-Level course develops pupils' ability to think logically and analytically, solve problems and break their thinking into steps.
The three overarching themes in A Level Mathematics are thus:
Mathematical argument, language and proof,
Mathematical problem solving
Mathematical modelling.

Structure of the Course

Pure mathematics, statistics and mechanics are taught throughout the two years.

Pure Mathematics content

Topic 1: Proof
Topic 2: Algebra & Functions
Topic 3: Coordinate Geometry in the x,y plane
Topic 4: Sequences & Series
Topic 5: Trigonometry
Topic 6: Exponentials & Logarithms
Topic 7: Differentiation
Topic 8: Integration
Topic 9: Numerical Methods
Topic 10: Vectors

Statistics & Mechanics

Statistics
Topic 1: Statistical Sampling
Topic 2: Data Presentation & Interpretation
Topic 3: Probability
Topic 4: Statistical Distributions
Topic 5: Statistical Hypothesis Testing

Mechanics
Topic 6: Quantities & Units in Mechanics
Topic 7: Kinematics
Topic 8: Forces & Newton's Laws
Topic 9: Moments

Structure of the Examination

There are three papers each is 2 hours in length. Papers 1 and 2 cover the pure mathematics content. Paper 3 is split into two equal sections; section A covers statistics, section B is on mechanics. Calculators are allowed in all of the papers. Each papers counts as one third of the overall qualification. There are three assessment objectives, which are AO1 – using and applying standard techniques (50%); AO2 – reason, interpret and communicate mathematically (25%); AO3 – solve problems within mathematics and in other contexts (25%).

Teaching and Learning

In Mathematics, pupils are encouraged to ask questions and attempt various mathematical approaches to a variety of different problems in a safe and inspirational environment where there is no fear of failure. During lessons, pupils have the opportunity to work both independently and together in pairs or groups. Outside of lessons, pupils are encouraged to develop as independent learners by regularly revising and practising extra questions in addition to completing the set homework tasks.