

Subject:
Further Mathematics

Mathematics Intent: Our Exam Board is: AQA
 The Maths department aims to challenge and inspire students to build logical, independent thinking skills, enabling a strong mathematical foundation to develop for every student, supporting success throughout the curriculum and throughout life.

The Big Questions...

Year 12	Year 13
<p>September-December:</p> <ul style="list-style-type: none"> - Can you square root a negative number? Does this concept have any meaning or indeed use? How do you represent transformations mathematically? Can you “multiply” vectors? What are the relationships between polynomial equations and their roots? What is Discrete Mathematics and how do we use it to solve real life problems? How do Polar Co-ordinates differ from conventional Cartesian Co-ordinates? <p>January-April:</p> <ul style="list-style-type: none"> - What are the Conic Sections? Can you graph Rational Functions? What are Hyperbolic Functions? What is Dimensional Analysis why do we use it? How can the concepts of Energy, Power and Momentum help us solve problems in Mechanics? How can we model Circular Motion mathematically? <p>May-July:</p> <ul style="list-style-type: none"> - How can Linear Programming help us to find feasible solutions to problems? What is Game Theory? What are Determinates how do they relate to matrix transformations? 	<p>September-December:</p> <ul style="list-style-type: none"> - Is there more than one vector product and how can we use that to model Lines and Planes in Vector Geometry? How do eigenvectors and eigenvalues enable us to diagonalise matrices? Can you use Calculus to find the areas of unbounded regions? How do we apply mathematical techniques to integrate in a variety of new cases? How can functions be approximated by polynomials? Is Euler’s Equation really the best equation in Mathematics? <p>January-April:</p> <ul style="list-style-type: none"> - What is Group Theory? Can equations be formed with derivatives? How can these Differential Equations be solved? What is De Moivre’s Theorem? How do you find higher order roots of unity, are they Real or Imaginary? Can we use Mechanics to find Centres of Mass? How do we model motion in a circle with a variable angular speed? <p>May-July:</p> <ul style="list-style-type: none"> - Revision and preparation for Further Mathematics A Level.

What skills will I develop?

In addition to the key Mathematical knowledge that students will master, a sound understanding of Mathematics will also develop logical thinking skills that enable the solving of the more complex problems that life throws at us. The Mathematics studied at A Level constitutes the broader basis of knowledge needed to be successful when studying higher level mathematics in scientific and engineering disciplines. Students are coached on techniques to break a problem into smaller more manageable parts and encouraged to transfer the skill they have learnt in the Maths class to other areas of the curriculum.

How will I be assessed?

Each week homework will be set, with details on SMHW. Students’ knowledge of a topic will be assessed using the results of this work. End of year exams will take place in Year 12 and mock exams in the January of Year 13.

Examination: The A level course is 100% exam-based and will involve three A level papers, taken at the end of Year 13. Papers 1 & 2 assess Pure Mathematics, Paper 3 assesses Mechanics and Discrete. All papers are 2 hours long.

What great resources can I use?

- <https://www.mathsgenie.co.uk/alevel.html> – selection of revision resources including past A Level questions sorted by Maths topic, with worked answers – excellent for final exam preparation.
- <https://www.physicsandmathstutor.com/> - A Selection of revision notes and exam questions
- <https://www.drfrostmaths.com/> - A series of revision resources including teaching PowerPoints often used in lessons
- <https://www.mymaths.co.uk/> - on-line lessons on every Maths topic in the A Level syllabus with linked practice questions. Marked on-line so students get instant feedback.
- <https://www.aqa.org.uk/subjects/mathematics/as-and-a-level> - exam board website with the full Mathematics GCSE specification.

Three ways that parents/carers can help...

1. A Level Maths students must be working on Maths for 5 hours each week, outside lessons, to ensure they have a full understanding of the topics being covered. Discuss with your child how they are spending this time and encourage them to get into a good routine from the start. This time should be spent finishing classwork/doing homework or revising using exam resources.
2. Encourage your child to approach their Maths homework as an opportunity to ensure they have an excellent understanding of that specific topic, rather than a task to tick to say it is done.
3. Help is available to all A Level Maths students every Wednesday after school in C2.6. Encourage your child to drop-in and use that time to improve their understanding as they progress through the year. It is important that students seek help and tackle misunderstandings at the earliest opportunity