Mathematics

Curriculum Intent: We build confidence with mathematical reasoning which is essential for everybody's future. We ensure that all students have the mathematical fluency, reasoning, and problem-solving skills to not only excel in assessments, but to fulfil their hopes and dreams in the world beyond. We motivate, challenge, and inspire a very able cohort, whilst supporting and nurturing students who lack confidence and those that struggle with mathematics. We deliver a curriculum which allows students to achieve the best they can.

Core knowledge:

A Level Mathematics builds on the skills, knowledge and understanding from GCSE Mathematics.
Core knowledge is guided by the subject content of the A Level Mathematics curriculum, under the headings:

- Pure Mathematics
- Statistics
- Mechanics

The Year 12 end of year assessment and the Year 13 Trial assessments will examine all of the headings above. The exact content of core curriculum is defined by the schemes of work for each year group.

Pure Mathematics

- Proof
- Algebra & Functions
- Co-ordinate Geometry
- Sequences & Series
- Trigonometry
- Exponentials & Logarithms
- Differentiation
- Integration
- Numerical Methods
- Vectors

Statistics

- Statistical Sampling
- Data Presentation & Interpretation
- Probability
- Statistical Hypothesis Testing

Mechanics

- Quantities & Units
- Kinematics
- Forces & Newton's Laws
- Moments (Y13 only)

Procedural knowledge (how to..):

A Level Mathematics will encourage learners to:

- understand mathematics and mathematical processes in a way that promotes confidence, fosters enjoyment and provides a strong foundation for progress to further study
- extend their range of mathematical skills and techniques
- understand coherence and progression in mathematics and how different areas of mathematics are connected
- apply mathematics in other fields of study and be aware of the relevance of mathematics to the world of work and to situations in society in general
- use their mathematical knowledge to make logical and reasoned decisions in solving problems both within pure mathematics and in a variety of contexts, and communicate the mathematical rationale for these decisions clearly
- reason logically and recognise incorrect reasoning
- generalise mathematically
- construct mathematical proofs
- use their mathematical skills and techniques to solve challenging problems which require them to decide on the solution strategy

- recognise when mathematics can be used to analyse and solve a problem in context
- represent situations mathematically and understand the relationship between problems in context and mathematical models that may be applied to solve them
- draw diagrams and sketch graphs to help explore mathematical situations and interpret solutions
- make deductions and inferences and draw conclusions by using mathematical reasoning
- interpret solutions and communicate their interpretation effectively in the context of the problem
- read and comprehend mathematical arguments, including justifications of methods and formulae, and communicate their understanding
- read and comprehend articles concerning applications of mathematics and communicate their understanding
- use technology such as calculators and computers effectively and recognise when such use may be inappropriate
- take increasing responsibility for their own learning and the evaluation of their own mathematical development.

Assessment:
- Teacher questioning in lessons.
- Regular review questions at the beginning of lessons to check on prior learning.
- Regular exam question practice with either whole class or individual feedback.
- Basic Skills assessment in October of Y12, followed by exam weeks in January and May / June of Year 12.
- Pure Mathematics assessment in November of Y13, followed by trial exam weeks in February and April of Year 13.
- Final A Level exams in June of Year 13.

Homework:
- Weekly homework is set using predominantly the course textbook, alongside other resources.
- Revision tasks are also set as homework to prepare for the assessments.

Links to careers and personal development include:
- Mathematical knowledge, skills and their application to problem solving is key and requires resilience and the willingness to make mistakes and learn from them.
- The curriculum is linked to the real world wherever possible.
- We make cross curricular links with science, technology, geography, food etc wherever possible.
- We support students to get the best grades that they can so they have as much career choice as possible