HOE VALLEY SCHOOL

FURTHER MATHS A-LEVEL

The Maths curriculum looks to develop students ability to contextualise their knowledge in to real-world terms e.g. currency exchange, instead of an autopilot rote-learning approach. We look to develop independent logical thinkers who are able to problem solve and provide solutions, as opposed to producing students who can simply remember a formula.

"To every problem, there is a solution"

YEAR 12

Students develop a deep understanding of mathematical concepts and processes, building confidence and enjoyment in the subject while preparing for further study. They explore the connections between different areas of mathematics, apply a wide range of skills to solve complex problems, and learn how to construct clear mathematical arguments and proofs. Students also learn to model real-world situations mathematically, using diagrams and graphs to support problem-solving and interpretation. Throughout the course, they are encouraged to think critically, justify their methods, and communicate their reasoning effectively.

YEAR 13

Students extend their knowledge in Pure Mathematics, exploring advanced methods like proof, algebra, trigonometry, calculus, and vectors that support all areas of mathematics.
The Statistics component focuses on interpreting data and calculating probabilities to draw meaningful conclusions.
Mechanics covers modelling physical phenomena, including motion and forces, providing valuable skills for careers in physics and engineering.
Additionally, the Decision Mathematics module introduces optimisation techniques used to solve real-world problems efficiently, with strong links to business and operational decision-making.
This course equips students with deep problem-solving and analytical skills essential for Higher Education and STEM careers.

Topics with the WR logo are directly linked to the Hoe Valley School Work Ready Agenda.

Revision **A-Level Exams**

APPLIED DECISION: Algorithms, Graphs & Networks, Algorithms on Graphs, Route Inspection, The Travelling Salesman Problem, Linear Programming, The Simplex Algorithm, Critical Path Analysis

FURTHER PURE: Integration, Maclaurin Series, Improper Integrals
APPLIED MECHANICS: Momentum & Impulse, Work Energy & Power, Elastic Strings & Springs, Elastic Collisions in 1 & 2D

YEAR 13

FURTHER PURE: Matrices, Proof, Complex Numbers, Solutions of Equations, Argand Diagrams & Loci, Further Vectors, Solutions of Equations & Intersections of Planes, Exponential Form of Complex Numbers & Geometric Effects

FUTHER PURE:
Euler's Formula, de Moivre's Thoerem, Summation of Series, Further Vectors, Polar Coordinates & Area Enclosed by a Polar Curve, Hyperbolic Functions, Differential Equations & 2nd Order, Homogeneous, Differential Equations, Volumes of Solids of Revolution, Inverse Hyperbolic Function, Non-Homogeneous, Simple Harmonic, Motion & Damped Oscillations

Revision

End of Year Exams

PURE: Numerical Methods, Intergration, Vectors

STATISTICS: Regression & Correlation, Probability, Normal Distribution
MECHANICS: Moments, Forces at any angle, Projectiles, Kinematics, Application of Forces

PURE: Algebraic Methods, Functions & Graphs, Sequences & Series, Binominal Expansion, Radians, Trigonometric, Functions, Trigonometry & Modelling, Parametric Equations, Differentiation

YEAR 12

PURE: Vectors, Differentiation, Integration, Exponentials and Logarithms
STATISTICS: Statistical Sampling, Data Presentation & Interpretation, Probability, Statistical Distribution, Statistical Hypothesis, Testing
MECHANICS: Modelling, Quantities & Units, Kinematics

PURE: Algebraic Expressions, Quadratics, Equations & Inequalities, Graphs & Transformations, Straight Line Graphs, Circles, Algebraic Methods, Binominal Expansion, Trig Ratios, Trig Identities and Equations