

Beyond AGS

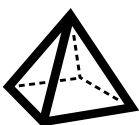
As well as underpinning a life-long love of maths, A-Level maths is vital for progression onto a high number of degree pathways and many careers including:

- Actuarial Science
- Health Service
- Accountancy
- Banking
- Cybersecurity
- Energy
- Marketing
- Insurance
- Defence
- Engineering



Probability and continuous random variables

Conditional probability
The binomial and Normal distributions
Probability models



Probability and discrete random variables

Understanding key vocabulary in statistics
Mutually exclusive and independent events
Probability functions and distributions
Experiments modelled by the binomial distribution

Collecting, representing and interpreting data

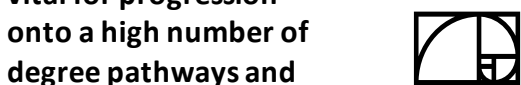
Sampling methods and bias
Continuous data and associated graphs
Correlation
Raw data and measures of spread

Units and kinematics

Understand and use SI units
Speed and velocity
Draw and interpret graphs of displacement and velocity against time
SUVAT equations
Using calculus to solve problems with variable acceleration

Exponentials and logarithms

Convert between powers and logarithms
Solve problems involving powers and logarithms
Sketching exponential functions
Considering limitations of exponential models



Hypothesis testing 2

Testing for correlation
PMCC
Mean of a Normal distribution

Forces 2

Vectors in three dimensions
Frictional force
Systems
Differential equations involving $f=ma$
Moments

Motion in two dimensions

Constant acceleration for motion in two dimensions
Using calculus to solve problems
Projectiles
Motion of an object

Algebra 2

Making logical deductions and prove statements directly
Functions, parametric equations and algebraic fractions
Partial fractions



Forces and Newton's laws

Particles in equilibrium
Magnitude and direction of a force
Understand the connection between weight and mass
Resolve forces for connected objects and particles

Vectors

Identify vector and scalar quantities
Solving two dimensional problems
Displacement, forces and velocity
Component form of a vector

PURE

Differentiation and integration

Basic differentiation
Find equations, tangents and Normals
Work out turning points and determine their nature. Interpret the second derivative
Basic integration
Calculate definite integrals

Trigonometry

Using and applying trigonometric identities
Sine and cosine rule

Polynomials and the binomial theorem

Manipulate, simplify and factorise polynomials
The binomial theorem
Dividing polynomials
The factor theorem
Analyse a function and sketch its graph.



A level Mathematic Learning Journey



Differentiation 2

Convex and concave curves
Points of inflection
Small angle estimations
Trigonometric functions
Exponentials and natural logarithms
Product and quotient rules
Chain rule
Implicit differentiation
Inverse functions
Parametric functions

Trigonometric identities

Degrees and radians
Reciprocal and inverse trigonometric functions
Compound and double angles

Numerical methods

Change of sign method
Iteration
Newton-Raphson method
Trapezium rule

Integration and differential equations

Standard functions
Area between two curves
Integration by substitution
Integration by parts
Partial fractions
Differential equations

Sequences

Binomial expansion
Arithmetic and geometric sequences

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Hypothesis testing 1

Understanding null and alternative hypothesis
Critical values and regions to include significance levels
Calculating a p-value
Concluding a hypothesis test

Algebra 1

direct proof, proof by exhaustion and counter examples, Use and manipulate the index laws
Manipulate surds and rationalise a denominator, quadratic equations, Linear and non-linear simultaneous equations

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Transition from Year 11
Bridging the gap between GCSE and A Level Mathematics including Algebra, Trigonometry and Graphs