



Year 13 Maths Curriculum Map

Overview	The A Level course continues, underpinned by the knowledge and understanding gained in Year 12. The key AS topics of trigonometry, functions and calculus are developed and further applied units are also explored. Student progress continues to be assisted and enhanced through the Integral online learning platform.	
Year 13	Autumn 1 & 2	Spring 1 & 2
Topic	Functions Trigonometric identities Differentiation A model for friction Further differentiation Probability Statistical distributions Proof Vectors Kinematics Projectiles Further algebra Integration.	Numerical methods Further hypothesis testing Integration Parametric equations Moments of a force Differential equations
Knowledge	Understanding the language of functions and transformations. Using composite functions. The modulus function. Using the compound angle formulae. Double angle formulae. Form of $r\cos(a \pm b)$, $r\sin(a \pm b)$. Differentiation from first principles, increasing & decreasing functions, concave up/down, stationary points. Using the chain rule. Connected rates of change. Product and quotient rules. Calculations with coupled mass systems and 2D force systems using friction.	Using the change of sign method, fixed point iteration, staircase and cobweb diagrams. Newton Raphson method. Numerical integration – trapezium rule and using rectangles. Mean and standard deviation with the Normal Distribution. Bivariate data and correlation coefficients. Finding area between curve and both axes, finding area between 2 curves Integration by substitution. Integrating trig and exponential functions. Integration involving natural log form $(f'(x)/f(x))$ and by partial fractions. Further integration by substitution. Integration by parts, including the natural log function.

	<p>Differentiating exponents and logs. Differentiating trig functions. Implicit differentiation.</p> <p>Calculations of probability from 2 experiments. Conditional probability.</p> <p>Discrete random variables. The Normal Distribution.</p> <p>Using 3D vectors and vectors in mechanics. Applying vectors to solve problems – vector geometry. Using vectors to represent motion in 2D and 3D.</p> <p>Deriving & using equations for projectile motion. Representing motion with vectors. Projectile problem solving 21.4 The path of a projectile in parametric and Cartesian form. The derivation of general equations.</p> <p>Problem solving and proof types.</p> <p>Using the general binomial expansion. Simplifying algebraic expressions (products and quotients). Using and deriving partial fractions.</p>	<p>Drawing graphs from parametric equations. Finding the equation by eliminating the parameter. Differentiating parametric equations.</p> <p>Forming and solving basic types of differential equation. Solving DEs by separating variables.</p>
Skills	<p>Through the course our students will develop the ability to construct and clearly present mathematical and logical arguments using the correct mathematical terminology and notation. They will develop the ability to deal with highly abstract concepts and continue to build advanced numeracy skills. They will use their topic understanding to turn real world problems into mathematical ones, using appropriate modelling with mathematical functions. They will build their communication and interpersonal skills, as well as independent study skills. The challenging nature of the subject fosters commitment, resilience and determination.</p>	