



# A Level Mathematics Curriculum RoadMap



	Year 12			Year 13		
	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Pure	<ul style="list-style-type: none"> <li><b>Algebra and Functions:</b> Expressions, equations, quadratics and inequalities. Use of the discriminant.</li> <li><b>Graphs and Transformations:</b> Trigonometric, reciprocal and polynomial transformed by reflection, translation or stretch.</li> <li><b>Further Algebra:</b> Factor theorem, polynomial division, binomial expansion, proof</li> <li><b>Coordinate Geometry:</b> Equations of straight lines and circles, points of intersection.</li> </ul>	<ul style="list-style-type: none"> <li><b>Vectors:</b> Magnitude and direction, resultant vectors, problem solving including distance between two points and bearings.</li> <li><b>Trigonometry 1:</b> Trigonometric graphs, identities and equations.</li> <li><b>Differentiation 1:</b> First principals, gradient functions, tangents and normal, stationary points and optimization.</li> <li><b>Integration:</b> Fundamental theorem of calculus, the power law, area under a curve.</li> </ul>	<ul style="list-style-type: none"> <li><b>Exponentials and Logarithms:</b> Exponential and log graphs and functions, derivative of <math>e^x</math>, laws of logarithms, equations, and modelling growth and decay.</li> <li><b>Proof:</b> Deduction and contradiction.</li> <li><b>Algebraic and Partial Fractions:</b> Algebraic division, improper fractions.</li> </ul>	<ul style="list-style-type: none"> <li><b>Sequences and Series:</b> nth term, recurrence relations, sigma notation, formulae for arithmetic and geometric series, modelling.</li> <li><b>Functions and Modelling:</b> Modulus of a linear function, composite and inverse functions.</li> <li><b>The Binomial Theorem:</b> Expansion of <math>(a + bx)^n</math> for rational n.</li> <li><b>Trigonometry 2:</b> Radians, arc length, sector area, identities and equations, double and compound angle formulae, reciprocal and inverse functions.</li> </ul>	<ul style="list-style-type: none"> <li><b>Parametric Equations:</b> Parametric curves and conversion between cartesian and parametric forms, integration and differentiation.</li> <li><b>Differentiation 2:</b> Trigonometric, exponential, chain, product and quotient rules, differential equations.</li> <li><b>Numerical Methods:</b> Change of sign, Newton-Raphson method.</li> <li><b>Integration:</b> Trigonometric, exponential, substitution, by parts, differential equations, trapezium rule.</li> </ul>	<ul style="list-style-type: none"> <li><b>Vectors in 3D:</b> Column vectors, i j and k notation, modelling.</li> <li><b>Revision</b></li> </ul>
Mechanics	<ul style="list-style-type: none"> <li><b>Quantities and Units in Mechanics:</b> SI units and conversions.</li> <li><b>Kinematics 1:</b> Graphs of speed, distance, velocity, displacement and time. Constant acceleration (SUVAT) equations and equations of motion.</li> </ul>	<ul style="list-style-type: none"> <li><b>Forces and Newton's Laws:</b> Newton's three laws, equations of motion in 1D or simple 2D, free body diagrams, connected particles.</li> <li><b>Kinematics 2:</b> Integration and differentiation with acceleration, velocity and displacement.</li> </ul>	<ul style="list-style-type: none"> <li><b>Moments:</b> Simple static contexts, resolving clockwise and anti-clockwise and including equations of motion.</li> </ul>	<ul style="list-style-type: none"> <li><b>Forces at any Angle:</b> Resolving forces in 2D, friction and limiting equilibrium.</li> <li><b>Application of Kinematics:</b> Motion under gravity in 2D, projectiles.</li> </ul>	<ul style="list-style-type: none"> <li><b>Application of Forces:</b> Complex systems involving motion in 1D or 2D, connected particles, friction and/or moments with non-parallel coplanar forces.</li> <li><b>Further Kinematics:</b> Extending constant acceleration (SUVAT) formulae to 2D with vectors, calculus with vectors.</li> </ul>	<ul style="list-style-type: none"> <li><b>Revision</b></li> </ul>
Statistics	<ul style="list-style-type: none"> <li><b>Probability 1:</b> Mutually exclusive and independent events.</li> <li><b>Statistical Distributions:</b> Discrete probability distributions, binomial distribution.</li> <li><b>Sampling</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Data Presentation and Interpretation:</b> Standard deviation, variance, central tendency, statistical diagrams.</li> <li><b>Statistical Hypothesis Testing:</b> Hypothesis testing in context for binomial distributions.</li> </ul>	<ul style="list-style-type: none"> <li><b>Regression and Correlation:</b> Correlation coefficients in context and hypothesis testing for correlation.</li> <li><b>Probability 2:</b> Conditional probability using Venn diagrams, tree diagrams and/or two-way tables.</li> </ul>	<ul style="list-style-type: none"> <li><b>The Normal Distribution 1:</b> Understand symmetry, modelling, links to histograms and testing hypothesis.</li> </ul>	<ul style="list-style-type: none"> <li><b>The Normal Distribution 2:</b> Modelling, approximating binomial distribution with a normal, known and unknown variance and/or standard deviation.</li> </ul>	<ul style="list-style-type: none"> <li><b>Revision</b></li> </ul>