

Year 13

Maths

Year Calendar Plan		
Dates	Lesson Focus	Assessment/Review
6 (Year 12)	<p><u>Pure A-Level Unit 1: Proof</u></p> <ul style="list-style-type: none"> Examples including proof by deduction, proof by exhaustion and disproof by counter example. <p><u>Pure A-Level Unit 2: Algebraic and Partial Fractions</u></p> <ul style="list-style-type: none"> Simplifying algebraic fractions; Partial fractions. 	<p><u>Concept Checks:</u> Proof by Contradiction</p> <p><u>Unit Review:</u> Proof</p> <p><u>Spaced Repetition:</u> N/A</p>
Term 1	<p><u>Pure A-Level Unit 5: The Binomial Theorem</u></p> <ul style="list-style-type: none"> Expanding $(a + bx)^n$ for rational n knowledge of range of validity; Expansion of functions by first using partial fractions. <p><u>Pure A-Level Unit 3: Functions and Modelling</u></p> <ul style="list-style-type: none"> Modulus function; Composite and inverse functions; Transformations; Modelling with functions (trigonometric, exponential, reciprocal etc.) <p><u>Pure A-Level Unit 4: Sequences and Series</u></p> <ul style="list-style-type: none"> Arithmetic and geometric progressions (proofs of 'sum formulae'); Sigma notation; Recurrence and iterations. <p><u>Statistics & Mechanics A-Level Unit 4: Moments</u></p> <ul style="list-style-type: none"> Forces' turning effect 	<p><u>Concept Checks:</u> Partial Fractions The Binomial Expansion Functions Transformations of Graphs Arithmetic/Geometric Sequences & Series Recurrence Relations</p> <p><u>Unit Review:</u> Algebra Functions Sequences & Series</p> <p><u>Spaced Repetition:</u> Paper 1 Paper 2</p>
Term 2	<p><u>Pure A-Level Unit 6: Trigonometry</u></p> <ul style="list-style-type: none"> Radians (exact values), arcs and sectors; Small angles; Secant, cosecant and cotangent (definitions, identities and graphs); Inverse trigonometric functions; Compound and double (and half) angle formulae; Geometric proof of compound angle formula; $R \cos(x \pm \alpha)$ or $R \sin(x \pm \alpha)$; Proving trigonometric identities; Solving problems in context (e.g. mechanics). 	<p><u>Concept Checks:</u> Moments Radians Small Angle Approximations Reciprocal Trigonometric Functions Pythagorean Trigonometric Identities Compound & Double Angle Identities Harmonic Trigonometric Functions Parametric Equations Conditional Probability</p>
Term 3	<p><u>Pure A-Level Unit 7: Parametric Equations</u></p> <ul style="list-style-type: none"> Definition and converting between parametric and Cartesian forms; Curve sketching and modelling. <p><u>Statistics & Mechanics A-Level Unit 2: Probability</u></p> <ul style="list-style-type: none"> Using set notation for probability. Conditional probability; Questioning assumptions in probability. <p><u>Pure A-Level Unit 8: Differentiation</u></p> <ul style="list-style-type: none"> Differentiating $\sin x$ and $\cos x$ from first principles; Differentiating exponentials and logarithms. 	<p><u>Unit Review:</u> Trigonometry Trigonometric Functions Trigonometric Identities</p> <p><u>Spaced Repetition:</u> Paper 3 Paper 4</p>
Term 4	<p><u>Pure A-Level Unit 8: Differentiation</u></p> <ul style="list-style-type: none"> Differentiating products, quotients, implicit and parametric functions; Second derivatives (rates of change of gradient, inflections); Rates of change problems (including growth and kinematics) - see Integration (Part 2) – Differential equations. <p><u>Pure A-Level Unit 9: Numerical methods - see Integration (Part 2) for the trapezium rule</u></p> <ul style="list-style-type: none"> Location of roots; Solving by iterative methods (knowledge of 'staircase and cobweb' diagrams); Newton-Raphson method; Problem solving. <p><u>Statistics & Mechanics A-Level Unit 3: The Normal distribution</u></p> <ul style="list-style-type: none"> Understand and use the Normal distribution; Use the Normal distribution as an approximation to the binomial distribution; Selecting the appropriate distribution; Statistical hypothesis testing for the mean of the Normal distribution. 	<p><u>Concept Checks:</u> The Chain Rule The Product Rule The Quotient Rule Differentiating Trigonometric Functions Implicit Differentiation Parametric Differentiation Iteration The Newton-Raphson Method</p> <p><u>Unit Review:</u> Parametric Equations Conditional Probability Differentiation Further Differentiation Numerical Methods</p> <p><u>Spaced Repetition:</u> Paper 5</p>
Term 5	<p><u>Statistics & Mechanics A-Level Unit 1: Regression and Correlation</u></p> <ul style="list-style-type: none"> Change of variable; Correlation coefficients; Statistical hypothesis testing for zero correlation. <p><u>Statistics & Mechanics A-Level Unit 6: Applications of Kinematics</u></p> <ul style="list-style-type: none"> Projectiles. 	<p><u>Concept Checks:</u> The Normal Distribution The Normal Approximation to the Binomial Dist. Hypothesis Testing with the Normal Distribution Hypothesis Testing for Zero Correlation</p>

		Non-Linear Regression Projectiles
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