

Year 12 Maths

Year Calendar Plan		
Dates	Lesson Focus	Assessment/Review
Term 1	<p><u>Pure AS Unit 1: Algebra and Functions</u></p> <ul style="list-style-type: none"> Algebraic Expressions – basic manipulation with indices and surds; Quadratic Functions – factorising, solving, graphs and discriminants; Linear and quadratic simultaneous equations; Linear and quadratic inequalities; Cubic, quartic and reciprocal graphs; Transformations of graphs – $f(x)$ notation. 	<p><u>Concept Checks:</u> Algebraic Expressions Completing the Square Quadratic Inequalities & Simultaneous Equations</p> <p><u>Unit Review:</u> Indices & Surds Quadratic Functions</p> <p><u>Spaced Repetition:</u> Paper 1</p>
Term 2	<p><u>Statistics & Mechanics Unit 1: Statistical Sampling – terminology and techniques*</u></p> <p><u>Statistics & Mechanics Unit 2a: Data Representation</u></p> <ul style="list-style-type: none"> Measures of central tendency, other location and spread; Coding. <p><u>Pure AS Unit 2: Coordinate Geometry in the (x, y) plane</u></p> <ul style="list-style-type: none"> Straight Line Graphs; Circles. <p><u>Pure AS Unit 3: Further Algebra</u></p> <ul style="list-style-type: none"> Algebraic division, the factor theorem and proof; The binomial expansion. <p><u>Statistics & Mechanics Unit 6: Quantities and Units in Mechanics*</u></p> <ul style="list-style-type: none"> Introduction to mathematical modelling and standard S.I. units of length, time and mass; Definitions of force, velocity, speed, acceleration and weight and displacement; Vector and scalar quantities. <p><u>Statistics & Mechanics Unit 2b: Data Presentation and Interpretation</u></p> <ul style="list-style-type: none"> Interpret diagrams for single-variable data; Interpret scatter diagrams and regression lines; outliers. 	<p><u>Concept Checks:</u> The Discriminant Graphs & Transformations Interpolation & Standard Deviation The Equation of a Straight Line The Equation of a Circle Proof Algebraic Division & the Factor Theorem The Binomial Expansion</p> <p><u>Unit Review:</u> Equations & Inequalities Graphs & Transformations Coordinate Geometry</p> <p><u>Spaced Repetition:</u> Paper 2 Paper 3</p>
Term 3	<p><u>Pure AS Unit 4: Trigonometry</u></p> <ul style="list-style-type: none"> Trigonometric ratios and graphs; Trigonometric identities and equations. <p><u>Statistics & Mechanics Unit 7: Kinematics</u></p> <ul style="list-style-type: none"> Graphical representation of velocity, acceleration and displacement; 	<p><u>Concept Checks:</u> Histograms Box Plots Sine Rule, Cosine Rule & Area of a Triangle Trigonometric Equations Equations of Constant Acceleration (SUVAT)</p>
	<p><u>Statistics & Mechanics Unit 7: Kinematics <i>continued</i></u></p> <ul style="list-style-type: none"> Motion in a straight line under constant acceleration; <i>suvat</i> formulae; Vertical motion under gravity. <p><u>Pure AS Unit 5: Vectors</u></p> <ul style="list-style-type: none"> Definitions, magnitude/direction, addition and scalar multiplication; Position vectors, distance between two points, geometric problems. <p><u>Statistics & Mechanics Unit 3: Probability</u></p> <ul style="list-style-type: none"> Mutually exclusive events; Independent events. 	<p><u>Concept Checks:</u> Velocity-Time Graphs</p> <p><u>Unit Review:</u> Polynomials The Binomial Expansion Data Collection & Interpretation Trigonometry Equations of Constant Acceleration</p> <p><u>Spaced Repetition:</u> Paper 4</p>
Term 4	<p><u>Statistics & Mechanics Unit 4: Statistical Distributions</u></p> <ul style="list-style-type: none"> Use and identify discrete distributions; Calculate probabilities using the binomial distribution (calculator use expected). <p><u>Statistics & Mechanics Unit 8: Forces & Newton's Laws</u></p> <ul style="list-style-type: none"> Newton's first law, force diagrams, equilibrium, introduction to i, j system; Newton's second law, (no resolving forces or use of $F = \mu R$); Newton's third law: equilibrium, smooth pulley problems. <p><u>Pure AS Unit 6: Differentiation</u></p> <ul style="list-style-type: none"> Definition, differentiating polynomials, second derivatives; Gradients, tangents, normals, maxima and minima. 	<p><u>Concept Checks:</u> Vectors in 2D Sampling* Probability Discrete Random Variables Forces & Motion in 2D $F = ma$</p> <p><u>Unit Review:</u> Vectors Probability</p> <p><u>Spaced Repetition:</u> Paper 5 Paper 6</p>
Term 5	<p><u>Pure AS Unit 7: Integration</u></p> <ul style="list-style-type: none"> Definition as opposite of differentiation, indefinite integrals of x^n; Definite integrals and areas under curves. 	<p><u>Concept Checks:</u> Differentiation from First Principles Differentiation</p>

	<u>Statistics & Mechanics Unit 5: Statistical Hypothesis Testing</u> <ul style="list-style-type: none"> • Language of hypothesis testing; • Significance levels; • Carry out hypothesis tests involving the binomial distribution. 	Integration Hypothesis Testing with the Binomial Distribution <u>Unit Review:</u> The Binomial Distribution
	<u>Pure AS Unit 8: Exponentials and Logarithms</u> <ul style="list-style-type: none"> • Exponential functions and natural logarithms; • Laws of logarithms 	<u>Unit Review:</u> Forces & Newton's Laws Differentiation Integration <u>Spaced Repetition:</u> Paper 7 Paper 8
Term 6	<u>Statistics & Mechanics Unit 9: Kinematics 2</u> <ul style="list-style-type: none"> • Variable force; • Calculus to determine rates of change for kinematics; • Use of integration for kinematics problems i.e. $r = \int v dt$, $v = \int a dt$. 	<u>Concept Checks:</u> Exponentials & Logarithms Variable Acceleration <u>Unit Review:</u> Hypothesis Testing Variable Acceleration <u>Spaced Repetition:</u> Paper 9