Year 12 Curriculum Grid
Mathematics

Year/Term	Unit	Intent
Overall		
Autumn	Pure - Algebraic Expressions	Index laws. Expanding brackets. Factorising. Negative and fractional indices. Surds. Rationalising denominators.
	Pure - Quadratics	Solving quadratic equations. Completing the square. Functions. Quadratic graphs. The discriminant. Modelling with quadratics.
	Pure - Expressions and Inequalities	Linear simultaneous equations. Quadratic simultaneous equations. Simultaneous equations on graphs. Linear inequalities. Quadratic inequalities. Inequalities on graphs. Regions.
	Pure - Graphs and Transformations	Cubic graphs. Quartic graphs. Reciprocal graphs. Points of intersection. Translating graphs. Stretching graphs. Transforming functions.
	Pure - Straight Line Graphs	$y = mx + c$. Equations of straight lines. Parallel and perpendicular lines. Length and area. Modelling with straight lines.
	Pure - Algebraic Methods	Algebraic fractions. Dividing polynomials. The factor theorem. Mathematical proof. Methods of proof.
	Pure - Trigonometric ratios	The cosine rule. The sine rule. Areas of triangles. Solving triangle problems. Graphs of sine, cosine and tangent. Transforming trigonometric graphs.
	Pure - Trigonometric Identities and Equations	Angles in all four quadrants. Exact values of trigonometrical ratios. Trigonometric identities. Simple trigonometric equations. Harder trigonometric equations. Equations and identities.
	Pure - Differentiation	Gradients of curves. Finding the derivative. Differentiating x^n, quadratics, functions with two or more terms. Gradients, tangents, normal. Increasing and decreasing functions. Second order derivatives. Stationary points. Sketching gradient functions. Modelling with differentiation.
Spring	Pure - Circles	Midpoints and perpendicular bisectors. Equation of a circle. Intersections of straight lines and circles. Use tangent and chord properties. Circles and triangles.
	Pure - Integration	Integrating x^n. Indefinite integrals. Finding functions. Definite integrals. Areas under curves. Area under the x-axis. Areas between curves and lines.

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	Pure - The Binomial Expansion	Pascal's triangle. Factorial notation. The binomial expansion. Solving binomial problems. Binomial estimation.
	Pure - Vectors	Representing vectors. Magnitude and direction. Position vectors. Solving geometric problems. Modelling with vectors.
	Pure - Exponentials and Logarithms	Exponential functions. $y = e^x$. Exponential modelling. Logarithms. Laws of logarithms. Solving equations using logarithms. Working with natural logarithms. Logarithms and non-linear data.
	Mechanics – Modelling in Mechanics	Constructing a model. Modelling assumptions. Quantities and units. Working with vectors.
	Mechanics – Constant Acceleration	Displacement-time graphs. Velocity-time graphs. Constant acceleration formulas. Vertical motion under gravity.
	Statistics – Data Collection	Populations and samples. Sampling. Non-random sampling. Types of data. The large data set.
	Statistics – Measures of Location and Spread	Measures of central tendency. Other measures of location. Measures of spread. Variance and standard deviation. Coding.
	Statistics – Representations of Data	Outliers. Box plots. Cumulative frequency. Histograms. Comparing data.
Summer	Mechanics – Forces and motion	Force diagrams. Forces as vectors. Forces and acceleration. Motion in 2 dimensions. Connected particles. Pulleys.
	Mechanics – Variable Acceleration	Functions of time. Using differentiation. Maxima and minima problems. Using integration. Constant acceleration formulae.
	Statistics – Correlation	Correlation. Linear regression.
	Statistics – Probability	Calculating probabilities. Venn diagrams. Mutually exclusive and independent events. Tree diagrams.
	Statistics – Statistical Distributions	Probability distributions. The binomial distributions. Cumulative probabilities.

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	Statistics – Hypothesis Testing		Hypothesis testing. Finding critical values. One-tailed tests. Two-tailed tests.