

Summative Assessment Planning Grid



Year 12 (Mathematics)			
	Summative Assessment 1 (Data for Progress Point 1)	Summative Assessment 2 (Data for Progress Point 2)	Summative Assessment 3 (Data for Progress Point 3)
Assessed Knowledge <i>What is the declarative (essential) knowledge that will be tested in this assessment?</i>	<p>Quadratics Solving Quadratic Equations: by factorising, by formula with simple sketches of curves</p> <p>Inequalities Linear and quadratic including discriminant Problems</p> <p>Simultaneous Equations linear, graphical interpretation, intersection of two lines, leading onto one linear, one quadratic</p> <p>Algebraic Fractions Factorising and cancelling in algebraic fractions, adding and subtracting.</p> <p>Algebraic Division Algebraic division by factorising and cancelling in algebraic fractions and dividing a polynomial by a linear expression</p> <p>Factor Theorem Factor theorem application and</p>	<p><u>All content previously assessed plus:</u></p> <p>Differentiation Differentiation introduction - gradient at a point (tangent and limits), understanding why it works Standard method practice (including fractional and negative indices). Equations of tangents and normals Increasing and decreasing functions and stationary points Optimisation problems</p> <p>Vectors Introduction, column vectors, i and j form, magnitude of a vector, adding vectors, unit vectors, multiplying by scalars</p>	<p><u>All core content previously assessed plus:</u></p> <p>Velocity/Time Graphs Distance time graphs and velocity time graphs</p> <p>Kinematics 1 SUVAT: understand and derive SUVAT equations SUVAT: problem solving SUVAT: motion under gravity</p> <p>Forces and Newton's Laws Forces: types of force, drawing force diagrams, Newton's first law, forces as vectors in i and j form, mass and weight Newton's second law - basic concepts, introducing resultant force = ma. Newton's second law - problem solving, including in terms of i and j Newton's third law - introduction, connected particles car and trailer Using Newton's second law - connected particles lifts</p>

	<p>use to fully factorise a cubic expression</p> <p>Proof Proof by deduction, exhaustion and disproof by a counter-example, following logical steps</p> <p>Indices laws of indices, evaluate expressions including negative, fractional and zero indices</p> <p>Surds manipulate surds, multiply and divide, rationalise the denominators, difference of two squares for rationalising</p> <p>Logarithms introduce and use $\log a = x$ and $a^x = n$. Introduce log laws solve equations in the form $ax = b$</p> <p>Logarithms solve equations in the form $ax = b$</p> <p>Binomial Expansion using Pascal's triangle and factorial notation Using formula including finding individual coefficients Using formula including finding estimates</p>	<p>Working with vectors, position vectors, use vectors to solve geometric problems Modelling with vectors, use vectors in speed and distance calculations</p> <p>Integration Understand as the reverse of differentiation, understand the need for $+c$, integrate polynomials Simple expressions, given $f'(x)$ and a point on the curve, find an equation of the form $f(x)$ Evaluate a definite integral Finding area bounded by a curve and the x-axis Area bounded by curves and straight lines</p> <p>Coordinate Geometry - lines straight lines: gradients, equation of a straight line, parallel and perpendicular lines, midpoints, lengths of line segments Intersection of two lines Parallel and perpendicular lines, length and area Problem solving</p> <p>Coordinate Geometry - circles equation of a circle</p>	<p>Forces and Newton's Laws Newton's third law - connected particles pulleys Newton's third law - smooth pulleys</p> <p>Kinematics 2 Kinematics variable acceleration (rates of change) - introduce displacement, velocity and acceleration as functions of time, use differentiation to model motion for a particle moving with variable acceleration understand gradients of graphs link to rates of change; find max and min velocities and understand how this links with $a=0$ introduce integration to model motion of a particle moving under a variable force Kinematics variable force (integration) - understand area under the graph leads to an integral, use initial conditions - use calculus to derive the constant accelerations formulae</p> <p>Probability Distributions Probability - mutually exclusive events, independent events, set notation, Tree diagrams and venn diagrams("and" "or" rules) Discrete probability distributions Binomial distribution - basic concepts, manual calculations, how to use calculator, link to Binomial expansion</p>
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	<p>Graphs and Transformations Sketching: cubics, quartics, reciprocals Transformations of functions</p>	<p>Intersections of straight lines and circles Problems involving tangents and chords Problems involving circles and triangles Trigonometry Sine and Cosine Rule Graphs and Transformations Solving equations Solving equations using the tan identity Solving equations using the Pythagorean identities</p>	<p>Binomial distribution - further calcs, use of tables Hypothesis Testing Intro to hypothesis testing using the Binomial distribution- null hypothesis, alternative hypothesis, significance level, p-value Hypothesis testing using probability of test statistic (p value) and comparing it to significance level, understanding critical regions and acceptance regions One and two tail tests Sampling Sampling Methods Statistical Measures Measures of location and variation 1 and 2: measures of central tendency: mean, median, mode including grouped data and using interpolation to find median also range, inter-quartile range and inter-percentile range including use of linear interpolation Measures of location and variation 3: variance and standard deviation Coding for mean and standard deviation Presenting Data Histograms and frequency polygons - using big data set for examples, include mean and standard deviation for a histogram</p>
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			Scatter graphs, correlation, and regression, independent and dependent variables. Interpolation and danger of extrapolation. Equation of line of best fit, and linear regression (note that students are not expected to calculate the PMCC or the equation of the Bivariate data using large data set - specific tasks Outliers and cleaning data: recognition and interpretation, choose appropriate data presentation techniques, clean the data - using the large data set.
Method of Assessment	Class Examination	Hall Examination	Hall examination
Dates of Assessment	Monday 20 th October – Friday 24 th October	Monday 2 nd March – Friday 6 th March	Monday 22 nd June – Friday 26 th June

Summative Assessment Planning Grid



Year 13 (Mathematics)			
	Summative Assessment 1 (Data for Progress Point 1)	Summative Assessment 2 (Data for Progress Point 2)	Summative Assessment 3 (Data for Progress Point 3)
Assessed Knowledge <i>What is the declarative (essential) knowledge that will be tested in this assessment?</i>	Radians Introduce radians, conversions, exact values and graphs Radian measures - arcs and sectors Solving trig equations in radians (including use of tan and Pythagorean identities) Small angle approximations Trig functions Introduction to sec, cosec, cot, sketching graphs Solving equations using cot identity and Pythagorean identities Proving trigonometric identities involving sec, cosec and cot Inverse Functions Use of Graphs Trig Addition Formulae Trig Double Angles Trig Proofs Differentiating Trig Functions Trig Modelling	<u>All Core Content plus</u> Regression and Correlation PMCC Hypothesis test - for zero correlation Probability Set notation, Conditional probability Venn Diagrams, Tree Diagrams and Formula Normal distribution Definition and Calculations The Inverse Normal The standard normal distribution (mean =0 and s.d. =1), standardise normally distributed random variables Finding the mean and standard deviation using standard normal Approximating a Binomial distribution Hypothesis testing	

	<p>Algebraic Fractions</p> <p>Partial Fractions</p> <p>Introduction - two and three linear terms</p> <p>Repeated linear term</p> <p>Improper algebraic fractions</p> <p>Differentiation</p> <p>Standard functions</p> <p>Chain Rule</p> <p>Product Rule</p> <p>Quotient Rule</p> <p>Implicit Differentiation</p> <p>Second Derivatives</p> <p>Rates of Change</p> <p>Integration</p> <p>Standard results</p> <p>$f(ax+b)$</p> <p>Reverse chain rule</p> <p>Substitution</p> <p>By parts</p> <p>Finding areas</p> <p>Trapezium Rule</p> <p>Separate the variables</p> <p>Functions</p> <p>Domain, range, composite, inverse, for simple functions</p> <p>Composite and inverse with e and ln</p> <p>Modulus functions</p>	<p>Mechanics</p> <p>Solving geometric problems and Application to mechanics</p> <p>Moments</p> <p>Introduction to moments</p> <p>Moments and equilibrium</p> <p>Non-uniform rods</p> <p>Tilting</p> <p>Resolving Forces</p> <p>Inclined planes</p> <p>Friction</p> <p>Projectiles</p> <p>Projectiles at any angle</p> <p>Deriving formulae</p> <p>Application of Forces</p> <p>Equilibrium</p> <p>Weight, tension and pulleys</p> <p>Friction and static particles</p> <p>Static rigid bodies</p> <p>Dynamics and inclined planes</p> <p>Connected particles on inclined planes</p> <p>Further Kinematics</p> <p>Vector equations of motion</p> <p>Vector methods with projectiles</p> <p>Variable acceleration in one dimension</p> <p>Differentiating vectors</p>	
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	<p>Integration Differential equations Modelling with differential equations Vectors 3D Co-ordinates and vectors in 3D</p> <p>Sequences and series Iterative/recurrence relations Arithmetic Geometric Binomial Series Use of the formula for negative and fractional values of n Additional bracket Approximations and binomial series from partial fractions</p> <p>Parametrics Convert to Cartesian Curve sketching Solving geometric problems Modelling and solving real life problems Differentiation</p>		
Method of Assessment	Hall Examination	Hall Examination	
Dates of Assessment	Monday 10 th November – Friday 14 th November	Monday 2 nd March – Friday 6 th March	