



St Benedict's Catholic High School
1971

A Level Maths intent statement

Year 12:

Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Algebraic expressions Quadratics Equations and inequalities The binomial expansion Algebraic methods Graphs and transformations Straight line graphs	Circles Trigonometric ratios Vectors Differentiation	Integration Trigonometric identities and equations Data collection Measures of location and spread Modelling in Mechanics	Representations of Data Correlation Probability Constant Acceleration Forces and Motion	Statistical distributions Hypothesis testing Variable Acceleration	Algebraic Methods Functions and Graphs Radians Sequences and series

Year 13:

Half term 1	Half term 2	Half term 3	Half term 4	Half term 5
Proof Binomial expansion Trigonometric functions Differentiation	Trigonometry and modelling Numerical methods Parametric equations Moments	Vectors Regression, Correlation and Hypothesis testing Forces and Friction Projectiles	Conditional Probability The Normal Distribution Applications of forces Further kinematics	Revision



Y12	Unit	Students will learn about:
Half term 1	Algebraic expressions	<ul style="list-style-type: none">• Index laws• Expanding and factorising• Simplifying surds
	Quadratics	<ul style="list-style-type: none">• Methods of solving quadratic equations• The discriminant of a quadratic function• Graphs of quadratic functions and how these relate to the completed square form of a quadratic and the discriminant• Modelling with quadratics
	Equations and inequalities	<ul style="list-style-type: none">• Solving simultaneous equations algebraically; both linear and one linear one quadratic• Solving simultaneous equations graphically• Solving linear and quadratic inequalities• Graphical representations of inequalities
	The binomial expansion	<ul style="list-style-type: none">• Pascals triangle and its link with the coefficients of a binomial expansion• Expanding binomial expressions with positive integer powers
	Algebraic methods	<ul style="list-style-type: none">• Simplifying algebraic fractions• Methods of algebraic division• The factor theorem• Methods of proof
	Graphs and transformations	<ul style="list-style-type: none">• Sketching polynomial graphs up to and including quartics• Sketching reciprocal graphs• Applying graph transformations
	Straight line graphs	<ul style="list-style-type: none">• Finding and using the equations of straight line graphs• Equations of perpendicular lines• Finding the distance between two points
Half term 2	Circles	<ul style="list-style-type: none">• The equation of a circle• The connection between some of the circle theorems and their links with equations of perpendicular lines
	Trigonometric ratios	<ul style="list-style-type: none">• Trigonometry in non right-angled triangles to find lengths, angles and areas.• Graphs of trigonometric functions
	Vectors	<ul style="list-style-type: none">• Vectors in 2 dimensions including the unit vectors parallel to the x and y axes• Adding and subtracting vectors, multiplying by a scalar and calculating the length of a vector



	Differentiation	<ul style="list-style-type: none"> Differentiation from 1st principles and applying this to simple polynomial functions The application of differentiation to the gradient of a curve and optimisation problems
Half term 3	Integration	<ul style="list-style-type: none"> Integration as the reverse of differentiation The use of integration to find areas under curves
	Trigonometric identities and equations	<ul style="list-style-type: none"> Exact trigonometric values for angles measured in degrees Trigonometric identities, $\tan\theta = \frac{\sin\theta}{\cos\theta}$ and $\sin^2\theta + \cos^2\theta = 1$, and how to use these to show given identities and solve equations
	Data collection	<ul style="list-style-type: none"> The terminology for collecting data and types of data
	Measures of location and spread	<ul style="list-style-type: none"> Calculating measures of location and dispersion for ungrouped and grouped data including mode, median, mean, quartiles, percentiles, range, interquartile range, inter percentile range, standard deviation and variance
	Modelling in Mechanics	<ul style="list-style-type: none"> Modelling in mechanics, the correct units to use for different quantities and about the differences between vector and scalar quantities
Half term 4	Representations of data	<ul style="list-style-type: none"> Identifying outliers and anomalies in data Constructing and interpreting box plots, cumulative frequency diagrams and histograms
	Correlation	<ul style="list-style-type: none"> Drawing and interpreting scatter graphs for bivariate data Use and interpret the equation of the regression line
	Probability	<ul style="list-style-type: none"> Calculating probabilities and the language of probability
	Constant acceleration	<ul style="list-style-type: none"> Graphs that represent the motion of particles moving under constant acceleration To derive and use the constant acceleration formulas
	Forces and motion	<ul style="list-style-type: none"> Forces and the effect of forces on the motion of particles
Half term 5	Statistical distributions	<ul style="list-style-type: none"> Discrete random variables including the idea of the discrete uniform distribution The Binomial distribution including the conditions for it to be a suitable model and using it to calculate probabilities
	Hypothesis testing	<ul style="list-style-type: none"> Hypothesis testing and apply it to data that can be modelled with a binomial distribution
	Variable acceleration	<ul style="list-style-type: none"> The motion of particles under variable acceleration and using calculus to solve problems To use calculus to derive the constant acceleration equations $v = u + at$ and $s = ut + \frac{1}{2}at^2$
Half term 6	Algebraic methods	<ul style="list-style-type: none"> Calculating with algebraic fractions Writing a fraction with linear factors on its denominator as the sum of its partial fractions
	Functions and graphs	<ul style="list-style-type: none"> The definitions and language of mappings and functions Composite functions



		<ul style="list-style-type: none">• Inverse functions• The modulus function
	Radians	<ul style="list-style-type: none">• The radian measure and its application to arc length and sector area• Solving trigonometric equations using radians• Small angle approximations
	Sequences and series	<ul style="list-style-type: none">• Arithmetic and geometric sequences and series• Generating sequences from recurrence relations• Increasing, decreasing and periodic sequences



Y13	Unit	Students will learn about:
Half term 1	Proof	<ul style="list-style-type: none">• Proof by contradiction
	Binomial expansion	<ul style="list-style-type: none">• Using the binomial expansion for values of n that are rational but not positive integers
	Trigonometric functions	<ul style="list-style-type: none">• The reciprocal and inverse trigonometric functions, their identities and their graphs
	Differentiation	<ul style="list-style-type: none">• Differentiating trigonometric, exponential and logarithmic functions• The chain, product and quotient rules for differentiation and when and how to use them
Half term 2	Trigonometry and modelling	<ul style="list-style-type: none">• The addition and double angle formulae and their applications
	Numerical Methods	<ul style="list-style-type: none">• Iteration and Newton-Raphson to approximate roots of equations including their limitations
	Parametric equations	<ul style="list-style-type: none">• Finding the cartesian equation for curves defined parametrically including finding domains and ranges• Sketching curves defined parametrically• Solving geometric problems involving curves defined parametrically
	Moments	<ul style="list-style-type: none">• Moments and their applications in static contexts involving parallel and non parallel coplanar forces
Half term 3	Vectors	<ul style="list-style-type: none">• Using vectors in 3D
	Regression, correlation and Hypothesis testing	<ul style="list-style-type: none">• Using the regression equation for bivariate data with an exponential relationship• Calculating the PMCC and interpreting the result• Carrying out a hypothesis test for zero correlation
	Forces and Friction	<ul style="list-style-type: none">• Resolving forces and friction and be able to apply friction to problems involving objects on horizontal and inclined planes
	Projectiles	<ul style="list-style-type: none">• Projectiles moving in 2 dimensions
Half term 4	Conditional Probability	<ul style="list-style-type: none">• Further set notation, conditional probability and probability formulas
	The Normal distribution	<ul style="list-style-type: none">• Properties of the Normal distribution• Finding probabilities for normal distributions• Standardising normally distributed data and using this to find unknown means and standard deviations• Approximating a binomial distribution with a normal distribution• Carrying out a hypothesis test for the mean of a normal distribution
	Applications of forces	<ul style="list-style-type: none">• Applying forces and solving problems involving objects both in and not in equilibrium, and objects that are and are not connected
	Further Kinematics	<ul style="list-style-type: none">• Using vectors with kinematics including problems with variable acceleration



Half term 5	Revision	<ul style="list-style-type: none">• Topic revision progressing to complete papers
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