



KS5 Curriculum Map – Mathematics:

Topic	Substantive Knowledge This is the specific, factual content for the topic, which should be connected into a careful sequence of learning.	Disciplinary Knowledge (Skills) This is the action taken within a particular topic in order to gain substantive knowledge.	Assessment Opportunities What assessments will be used to measure student progress?
Algebra and functions	<ul style="list-style-type: none"> • Surds and Indices 	<ul style="list-style-type: none"> • Use the laws of indices for all rational exponents. • Use and manipulate surds, including rationalising the denominator. 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams
Data Collection	<ul style="list-style-type: none"> • Populations and samples • Sampling • Non-random sampling • Types of data • Introduction to the large data set 	<ul style="list-style-type: none"> • Recall the terms 'population', 'sample' and 'census', interpret them in context and comment on the advantages and disadvantages of each. • Explain the implementation, advantages and disadvantages of simple random sampling, systematic sampling, stratified sampling, quota sampling and opportunity sampling. • Use samples to make informal inferences about the population • Define qualitative, quantitative, discrete and continuous data, and understand grouped data • Become fluent in the large data set and how to collect data from it, identify types of data and calculate simple statistics. • Select or critique sampling techniques in the context of solving a statistical problem 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams •

		and understand that different samples can lead to different conclusions about the population.	
Algebra and functions 2	<ul style="list-style-type: none"> • Expanding and Factorising • Algebraic Fractions • Partial fractions • Repeated factors • Algebraic division 	<ul style="list-style-type: none"> • Manipulate polynomials algebraically, including expanding brackets and collecting like terms, factorisation and simple algebraic division; use of the factor theorem • Simplify rational expressions, including by factorising and cancelling, and algebraic division (by linear expressions only). • Decompose rational functions into partial fractions • 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams
Measures of location and spread	<ul style="list-style-type: none"> • Measures of central tendency • Other measures of location • Measures of spread • Variance and standard deviation • Coding • 	<ul style="list-style-type: none"> • Calculate and interpret measures of central tendency such as the mean, median and mode • Calculate and interpret measures of location such as percentiles and deciles, using linear interpolation • Calculate and interpret measures of spread such as range, interquartile range and interpercentile range • Calculate and interpret variance and standard deviation, including from summary statistics • Use coding to find mean, variance and standard deviation 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams •
Algebra and functions 3	<ul style="list-style-type: none"> • Quadratics • Simultaneous Equations • Inequalities 	<ul style="list-style-type: none"> • Work with quadratic functions and their graphs. • Apply knowledge of the discriminant of a quadratic function, including the conditions for real and repeated roots. • Extend completing the square to more complicated expressions. • Solve quadratic equations (including solving quadratic equations in a function of the unknown) by factorisation, use of the 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams

		<p>formula, use of a calculator or completing the square.</p> <ul style="list-style-type: none"> • Solve simultaneous equations in two variables by elimination and by substitution, including one linear and one quadratic equation. • Solve linear and quadratic inequalities in a single variable and interpret such inequalities graphically, including inequalities with brackets and fractions. • Express solutions through correct use of 'and' and 'or', or through set notation. • Represent linear and quadratic inequalities on number lines and graphs. 	
Representations of data	<ul style="list-style-type: none"> • Outliers • Box plots • Cumulative frequency • Histograms • Comparing data 	<ul style="list-style-type: none"> • Identify and interpret outliers in data sets • Clean data, including dealing with missing data, errors and outliers. • Draw and interpret box plots • Draw and interpret cumulative frequency diagrams • Draw and interpret histograms • Compare two data sets 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams •
Coordinate geometry in the (x,y) plane	<ul style="list-style-type: none"> • Straight line Graphs • Equation of a Circle • Graph transformations 	<ul style="list-style-type: none"> • Derive and use the equation of a straight line, including the forms $y - y_1 = m(x - x_1)$ and $ax + by + c = 0$. • Find the equation of a line in the following cases: <ul style="list-style-type: none"> • two given points • parallel/perpendicular to a given line through a given point. • Apply gradient conditions for two straight lines to be parallel or perpendicular. • Use straight line models in a variety of contexts. • Derive and use the coordinate geometry of the circle including using the equation of a circle. 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams

		<ul style="list-style-type: none"> • Find the radius and the coordinates of the centre of the circle given the equation of the circle, and vice versa. • Complete the square to find the centre and radius of a circle; make use of the following properties: <ul style="list-style-type: none"> • the angle in a semicircle is a right angle • the perpendicular from the centre to a chord bisects the chord • the radius of a circle at a given point on its circumference is perpendicular to the tangent to the circle at that point. • Recall and use graphs of functions; sketch curves defined by simple equations including polynomials • Interpret algebraic solution of equations graphically; use intersection points of graphs to solve equations • Recall and use proportional relationships and their graphs. • Derive and sketch the effect of simple transformations on the graph of $y = f(x)$, including stretches, reflections and translations. Apply this to general curves with points given algebraically. 	
Correlation	<ul style="list-style-type: none"> • Introduction to correlation and the PMCC • Linear regression 	<ul style="list-style-type: none"> • Draw and interpret scatter diagrams for bivariate data • Interpret correlation and understand that it does not imply causation • Interpret the coefficients of a regression line equation for bivariate data • Derive and use a regression line to make predictions 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams •

<p>Probability and conditional probability</p>	<ul style="list-style-type: none"> • Sample spaces • Venn diagrams • Mutually exclusive and independent events • Tree diagrams • Set notation • Conditional probability • Conditional probability in Venn diagrams • Probability formulae • Conditional probability in tree diagrams 	<ul style="list-style-type: none"> • Calculate probabilities for single events • Draw and interpret Venn diagrams • Use definitions of mutually exclusive and independent events, and determine whether two events are independent • Use tree diagrams to solve problems • Use set notation in probability • Explore the concept of conditional probability • Solve conditional probability problems using two-way tables and Venn diagrams • Use probability formulae to solve problems • Solve conditional probability problems using tree diagrams • Explore simple modelling with probability, including critiquing assumptions made and the likely effect of more realistic assumptions. 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams •
<p>Trigonometry and radian measure</p>	<ul style="list-style-type: none"> • Sine, cosine and tangent of any angle • Cosine rule, sine rule and area of a triangle • Solve problems involving triangles • Trigonometric graphs and transformations • Use exact trigonometric ratios for 30°, 45° and 60° • Simple trigonometric identities • Solve trigonometric equations, including quadratics • Radians • Small angle approximations 	<ul style="list-style-type: none"> • Use of x and y coordinates of points on the unit circle to give cosine and sine respectively. • Derive from first principles, and use, the definitions of sine, cosine and tangent for all arguments • Use the sine/cosine rules and formula for the area of a triangle to solve complicated problems, including the ambiguous case of the sine rule. • Draw and use the sine, cosine and tangent functions; their graphs, symmetries and periodicity. • Apply transformations of graphs to sine, cosine and tangent functions. • Derive and use $\sin^2\theta + \cos^2\theta = 1$ and $\tan\theta = \frac{\sin\theta}{\cos\theta}$ • Solve simple trigonometric equations in a given interval, including quadratic 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams •

		<p>equations in sin, cos and tan and equations involving multiples of the unknown angle.</p> <ul style="list-style-type: none"> • Solve simple trigonometric equations in a given interval, including quadratic equations in sin, cos and tan and equations involving multiples of the unknown angle. • Convert between degrees and radians and apply this to trigonometric graphs and their transformations • Use exact values of angles measured in radians • Find the arc length using radians • Find area of sectors and segments using radians • Explore and use the standard small angle approximations of sine, cosine and tangent • Solve trigonometric equations in radians 	
Sequences and series 1	<ul style="list-style-type: none"> • The binomial theorem • The binomial series 	<ul style="list-style-type: none"> • Derive and use the binomial expansion of $(a + bx)^n$ for positive integer n. • Explore the notation $n!$ and nCr • Extend the binomial expansion to any rational n, including its use for approximation together with expansion validity • Apply knowledge of partial fractions to series expansions. 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams
Discrete probability distributions and the Binomial distribution	<ul style="list-style-type: none"> • Probability distributions • The Binomial distribution • Cumulative probabilities 	<ul style="list-style-type: none"> • Define and use simple discrete probability distributions including the discrete uniform distribution • Explore the binomial distribution as a model and comment on its appropriateness • Calculate individual probabilities for the binomial distribution • Calculate cumulative probabilities for the binomial distribution 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams

<p>Differentiation</p>	<ul style="list-style-type: none"> • Find the derivative of a simple function • Use the derivative to solve problems involving gradients, tangents and normal • Increasing and decreasing functions • Second derivatives • Stationary points • Sketch the gradient function of a given function • Model real life situations with differentiation • Derive a derivative from first principles 	<ul style="list-style-type: none"> • Use the derivative of $f(x)$ as the gradient of the tangent to the graph of $y = f(x)$ at a general point (x, y); the gradient of the tangent as a limit; interpretation as a rate of change • Given the graph of $y = f(x)$, sketch the graph of $y = f'(x)$ using given axes and scale. This could relate speed and acceleration for example. • Differentiate from first principles for small positive integer powers of x • Use the second derivative as the rate of change of gradient • Differentiate x^n, for rational values of n, and related constant multiples, sums and differences. • Apply differentiation to find gradients, tangents and normals, maxima and minima and stationary points. • Use differentiation to find equations of tangents and normals at specific points on a curve. • Identify where functions are increasing or decreasing. 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams
<p>The Normal distribution</p>	<ul style="list-style-type: none"> • Introduction to the normal distribution • Finding probabilities for the normal distribution • The inverse normal function • The standard normal distribution • Finding unknown parameters • Approximating a binomial distribution 	<ul style="list-style-type: none"> • Explore the normal distribution and the characteristics of a normal distribution curve • Find percentage points on a standard normal curve • Calculate values on a standard normal curve • Find unknown means and/or standard deviations for a normal distribution • Approximate a binomial distribution using a normal distribution and understand when it is appropriate to do so. • Select appropriate distributions and solve real-life problems in context 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams

<p>Integration</p>	<ul style="list-style-type: none"> • Integrating x^n • Indefinite integrals • Finding functions • Definite integrals • Areas under curves • Areas under the x-axis • Areas between curves and lines 	<ul style="list-style-type: none"> • Use the Fundamental Theorem of Calculus Integration as the reverse process of differentiation. Apply the constant of integration as required • Evaluate definite integrals; use a definite integral to find the area under a curve and the area between two curves • Evaluate the area of a region bounded by a curve and given straight lines, or between two curves. 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams
<p>Hypothesis testing</p>	<ul style="list-style-type: none"> • Introduction to hypothesis testing • Hypothesis testing with the binomial distribution • Hypothesis testing with the normal distribution • Extend correlation to include exponential models and the PMCC • Hypothesis testing for zero correlation • 	<ul style="list-style-type: none"> • Explore the language and concept of hypothesis testing • Use sample data to make an inference about a population • Find critical values of a binomial distribution • Carry out and interpret a one-tail test and a two-tail test for the proportion in the binomial distribution and interpret the results in context. • Carry out a hypothesis test for the mean of a normal distribution and interpret the results in context • Extend correlation to include exponential models and the PMCC • Carry out a hypothesis test for zero correlation, as a measure of how close data points lie to a straight line and interpret the results in context. 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams •
<p>Exponentials and logarithms</p>	<ul style="list-style-type: none"> • Exponential functions • Exponential modelling • Logarithms • Laws of Logarithms • Solving equations using logarithms • Working with natural logarithms • Logarithms and non-linear data 	<ul style="list-style-type: none"> • Use the function a^x and its graph, where a is positive. • Use the function e^x and its graph • Recognise that the gradient of e^{kx} is equal to ke^{kx} and apply the exponential model when appropriate. • Use the definition of $\log_a x$ as the inverse of a^x where a is positive and $x \geq 0$. 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams

		<ul style="list-style-type: none"> • Define and use the function $\ln x$ and its graph. • Use $\ln x$ as the inverse function of e^x • Solve equations of the form $e^{ax+b} = p$ and $\ln(ax + b) = q$ is expected. • Derive and use the laws of logarithms: • $\log_a x + \log_a y = \log_a(xy)$ • $\log_a x - \log_a y = \log_a\left(\frac{x}{y}\right)$ • $k \log_a x = \log_a x^k$ • Solve equations of the form $a^x = b$ • Use logarithmic graphs to estimate parameters in relationships of the form $y = ax^n$ and $y = kb^x$, given data for x and y • Use exponential growth and decay in modelling • Consider limitations of, and refine, exponential models. 	
Trigonometry 2	<ul style="list-style-type: none"> • Reciprocal trig functions and their graphs • Inverse trig functions and their graphs • Trigonometric identities • 	<ul style="list-style-type: none"> • Define secant, cosecant and cotangent and of arcsin, arccos and arctan, and their relationships to sine, cosine and tangent; sketch the graphs and identify their ranges and domains. • Prove the identities and • Use and to solve problems. • Simplify expressions, prove simple identities and solve equations involving secant, cosecant and cotangent • Derive and use the addition and double angle formulae • Use knowledge of addition formulae to derive expressions for $a\cos\theta + b\sin\theta$ in the equivalent forms of $r \cos(\theta \pm \alpha)$ or $r \sin(\theta \pm \alpha)$ • Construct proofs involving trigonometric functions and identities. 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams •

		<ul style="list-style-type: none"> Use trigonometric functions to solve problems in context, using degrees or radians. 	
Algebra and functions 2	<ul style="list-style-type: none"> Modulus function Functions and mappings Composite functions. Inverse functions Combining graph transformations Solving modulus problems 	<ul style="list-style-type: none"> Use functions in modelling, including consideration of limitations and refinements of the models 	<ul style="list-style-type: none"> Controlled Homework Baseline Assessments Short assessments Mock exams
Vectors	<ul style="list-style-type: none"> Representing vectors Magnitude and direction Position vectors Solving geometric problems Modelling with Vectors 	<ul style="list-style-type: none"> Use vectors in 2D Use column vectors and carry out arithmetic operations on vectors Calculate the magnitude and direction of a vector Define and use position vectors Use vectors in speed and distance calculations Use vector to solve problems in context. Apply knowledge of vectors to 3 dimensions. Use vectors to solve geometric problems Model 3D motion in mechanics with vectors 	<ul style="list-style-type: none"> Controlled Homework Baseline Assessments Short assessments Mock exams
Modelling in Mechanics	<ul style="list-style-type: none"> Constructing a model Modelling assumptions Quantities and units Working with vectors 	<ul style="list-style-type: none"> Explore the concept of mathematical modelling as applied to Mechanics. Identify and apply some of the common assumptions used in mechanics models. Use fundamental quantities and units in the S.I. system: length, time, mass. Convert quantities into S.I units e.g. km/h to m/s Define and use velocity, acceleration, force, weight, moment Identify scalar and vector quantities 	<ul style="list-style-type: none"> Controlled Homework Baseline Assessments Short assessments Mock exams

Kinematics	<ul style="list-style-type: none"> • Displacement – Time Graphs • Velocity – Time Graphs • Constant Acceleration Formulae <ul style="list-style-type: none"> ○ Horizontal motion ○ Vertical motion under gravity 	<ul style="list-style-type: none"> • Use the language of kinematics • Draw and interpret displacement-time graphs • Draw and interpret velocity-time graphs • Derive the constant acceleration formulae and use them to solve problems for horizontal motion. • Use the constant acceleration formulae to solve problems involving vertical motion under gravity. 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams
Variable acceleration	<ul style="list-style-type: none"> • Variable acceleration as a function of time • Using calculus to solve kinematics problems and problems involving maxima and minima • Vectors in kinematics 	<ul style="list-style-type: none"> • Use displacement, velocity and acceleration as functions of time. • Use differentiation and integration to solve kinematics problems. • Use calculus to derive the constant acceleration formulae, making links with earlier work. 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams
Coordinate geometry in the (x,y) plane	<ul style="list-style-type: none"> • Parametric Equations • Modelling with parametric equations 	<ul style="list-style-type: none"> • Convert between Cartesian and parametric forms • Sketch curves given in parametric form • Find points of intersection in parametric form • Use parametric equations in modelling in a variety of contexts. 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams
Forces and Newton's law	<ul style="list-style-type: none"> • Forces and motion <ul style="list-style-type: none"> ○ Newton's 1st Law ○ Force diagrams ○ Forces as vectors ○ Forces and acceleration (Newton's 2nd Law) ○ Motion in 2 dimensions ○ Connected particles and Newton's 3rd Law ○ Pulleys • Forces and friction <ul style="list-style-type: none"> ○ Resolving forces ○ Inclined planes 	<ul style="list-style-type: none"> • Draw force diagrams and calculate resultant forces • Explore and use Newton's First Law • Calculate resultant forces by adding vectors • Explore and use Newton's Second Law, $F = ma$ • Apply Newton's Second Law to vector forces and acceleration • Explore and use Newton's Third Law • Solve problems involving connected particles • Resolve forces into components 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams •

	<ul style="list-style-type: none"> ○ Friction ● Applications of forces <ul style="list-style-type: none"> ○ Static particles ○ Modelling with statics ○ Friction and static particles ○ Static rigid bodies ○ Dynamics and inclined planes ● Connected particles 2 	<ul style="list-style-type: none"> ● Use the triangle law to find a result force ● Understand friction and the coefficient of friction. ● Use $F \leq \mu R$ ● Solve problems involving smooth or rough inclined planes ● Find an unknown force when a system is in equilibrium ● Solve statics problems involving weight, tension and pulleys ● Solve problems involving limiting equilibrium ● Solve problems involving motion on rough or smooth inclined planes ● Solve problems involving connected particles that require the resolution of forces. 	
Differentiation 2	<ul style="list-style-type: none"> ● Know how to differentiate <ul style="list-style-type: none"> ○ trigonometric functions ○ exponentials and logarithms ○ using chain rule, quotient rule and product rule ○ parametric equations ○ implicit functions ● Use the second derivative to describe the behaviour of a functions ● Solve problems involving connected rates of change ● Construct simple differential equations ● 	<ul style="list-style-type: none"> ● Use the second derivative as the rate of change of gradient, connecting to convex and concave sections of curves and points of inflection. ● Differentiate e^{kx} and a^x, $\sin kx$, $\cos kx$, $\tan kx$ and related sums, differences and constant multiples. Prove the derivative of $\ln x$ is $1/x$. ● Differentiate $\sin x$ and $\cos x$ from first principles ● Differentiate using the product rule, the quotient rule and the chain rule, including problems involving connected rates of change and inverse functions. ● Differentiate simple functions and relations defined implicitly or parametrically, for first derivative only. ● Find equations of tangents and normals to curves given parametrically or implicitly. ● Construct simple differential equations in pure mathematics and in context 	<ul style="list-style-type: none"> ● Controlled Homework ● Baseline Assessments ● Short assessments ● Mock exams ●

<p>Moments</p>	<ul style="list-style-type: none"> • Moments and resulting moments • Equilibrium • Centres of mass • Tilting • Moments in 2D 	<ul style="list-style-type: none"> • Calculate the turning effect of a force applied to a rigid body. • Calculate the resultant moment of a set of forces acting on a rigid body • Solve problems involving uniform rods in equilibrium • Solve problems involving non-uniform rods • Solve problems involving rods on the point of tilting. • Solve problems involving moments of objects in 2D, including ladder and hinge problems. 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams •
<p>Projectiles</p>	<ul style="list-style-type: none"> • Projectiles <ul style="list-style-type: none"> ○ Horizontal projections ○ Horizontal and vertical components ○ Projection at any angle ○ Projectile motion formulae 	<ul style="list-style-type: none"> • Model motion under gravity for an object projected horizontally • Resolve velocity into components • Solve problems involving particles projected at an angle • Derive and use the formulae for time of flight, range and greatest height, and the equation of the path of a projectile. 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams
<p>Integration 2</p>	<ul style="list-style-type: none"> • Integrating standard functions • Integrating $f(ax + b)$ • Using trigonometric identities • Reverse chain rule • Integration by substitution • Integration by parts • Partial fractions • Finding areas • Solving differential equations • Modelling with differential equations • Integration as a limit of a sum 	<ul style="list-style-type: none"> • Integrate standard mathematical functions including trigonometric and exponential functions and use the reverse of the chain rule to integrate functions of the form $f(ax+b)$. • Use trigonometric identities in integration • Use the reverse chain rule to integrate more complicated functions • Integrate functions by making a substitution, using integration by parts, and using partial fractions. • Use integration to find the area under a curve. • Solve simple differential equations and model real-life situations with differential equations. 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams •

<p>Variable acceleration in 2D</p>	<ul style="list-style-type: none"> • Variable acceleration as a function of time • Using calculus to solve kinematics problems and problems involving maxima and minima • Vectors in kinematics 	<ul style="list-style-type: none"> • Extend earlier work to 2-D using vectors. • Work with vectors for displacement, velocity and acceleration when using the vector equations of motion. • Use calculus with harder functions of time involving variable acceleration. • Differentiate and Integrate vectors with respect to time. 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams •
<p>Sequences and Series 2</p>	<ul style="list-style-type: none"> • Arithmetic sequences and series • Geometric sequences and series • Geometric sum to infinity • Sigma notation • Recurrence relations • Modelling with Series 	<ul style="list-style-type: none"> • Work with sequences including those given by a formula for the nth term and those generated by a simple relation; increasing sequences; decreasing sequences; periodic sequences. • Derive and work with arithmetic sequences and series, including the formulae for nth term and the sum to n terms • Derive the proof of the sum formula for an arithmetic series, including the formula for the sum of the first n natural numbers • Derive and work with geometric sequences and series, including the formulae for the nth term, sum of a finite geometric series; sum to infinity of a convergent geometric series • Derive the proof of the sum formula for a geometric series • Given the sum of a series, use logs to find the value of n. • Use sequences and series in modelling. 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams
<p>Proof</p>	<ul style="list-style-type: none"> • Proof by deduction • Proof by counterexample • Proof by contradiction 	<ul style="list-style-type: none"> • Understand and use the structure of mathematical proof, proceeding from given assumptions through a series of logical steps to a conclusion; use methods of proof, including: • Proof by deduction • Proof by exhaustion • Disproof by counterexample 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams

		<ul style="list-style-type: none"> • Proof by contradiction (including proof of the irrationality of 2 and the infinity of primes, and application to unfamiliar proofs). 	
Numerical Methods	<ul style="list-style-type: none"> • Locating roots • Iteration • The Newton-Raphson Method • Applications to modelling • The trapezium rule 	<ul style="list-style-type: none"> • Locate roots of $f(x) = 0$ by considering changes of sign of $f(x)$ in an interval of x on which $f(x)$ is sufficiently well behaved. • Explore and use the limitations of change of sign method. • Solve equations approximately using simple iterative methods; be able to draw associated cobweb and staircase diagrams. • Use iteration to find a root and show understanding of the convergence in geometrical terms by drawing cobweb and staircase diagrams. • Solve equations using the Newton-Raphson method and other recurrence relations of the form $x_{n+1} = g(x_n)$ and explain how such methods can fail. • Use the trapezium rule to approximate the area under a curve, identifying limitations of this method. • Use numerical methods to solve problems in context. 	<ul style="list-style-type: none"> • Controlled Homework • Baseline Assessments • Short assessments • Mock exams