Maths Year 11 Higher Tier Curriculum End Points and key vocabulary

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Unit of Work	• Surds and exact calculations • Sequences • Linear Graphs • Probability, systematic listing and the product rule	• Quadratics • Simultaneous equations • Inequalities • Circle Theorems • Equation of a circle	• Direct and inverse proportion • Functions • Graphs • Iteration Vectors	• Transformations • Transforming functions • Plans and elevations • Loci and constructions Proof	*Revision and recap*	*Exams*
Ethos Links	STEM – use of exact calculations and importance of being exact within many STEM careers	STEM – Curves and graphs used to demonstrate exponential growth within bacteria	STEM and Sustainability – constructions and loci used within relation to landscape planning and gardening. Also used in relation to security cameras.	STEM – use of enlargement in scale models		
Knowledge	By the end of this unit students will know and understand: Surds By the end of this unit students will know and understand:	By the end of this unit students will know and understand: Quadratics By the end of this unit students will	By the end of this unit students will know and understand: Direct and inverse proportion By the end of this unit students will	By the end of this unit students will know and understand: Transformations By the end of this unit students will know and understand:		

	• Positive integer powers and associated real roots • ***How to estimate powers and roots of any given number*** • ***How to calculate exactly with surds*** • ***How to simplify surds*** • ***Rationalising the denominator*** • ***Expand double brackets involving surds*** Sequences (including quadratic) By the end of this unit students will know and understand: • Common sequences including geometric progression • Fibonacci sequences and	know and understand: • How to solve quadratic equations by factorising • How to find approximate solutions on a graph • ***The quadratic formula*** • ***How to factorise by completing the square*** • ***How to solve quadratics by completing the square*** • How to plot quadratic graphs • Roots, intercepts and turning points of quadratic functions and how to identify them • ***How to deduce turning points by completing the square***	know and understand: • Direct and inverse proportions • Equations that describe direct and inverse proportion • ***How to construct and interpret equations that describe direct and inverse proportion*** • Graphs that represent direct and inverse proportion Functions By the end of this unit students will know and understand: • How to interpret function notation • Use substitution	• How to transform shapes and recognise a combination of transformations • **Enlarge by a negative scale factor** Transforming functions By the end of this unit students will know and understand: • ***How to sketch translations and reflections of a given function*** Plans and elevations By the end of this unit students will know and understand: • Plans and elevations of 3D shapes • How to construct plans and elevations of 3D shapes		

	be able to apply and use them • How to deduce the nth term of linear sequences • ***How to deduce the nth term of quadratic sequences*** • ***Continue and interpret sequences with surds*** Linear graphs By the end of this unit students will know and understand: • How to plot straight line graphs • Parallel lines and how to identify them • *How to find the equation of a line given 2 points* • ***How to use y=mx+c to identify perpendicular lines***	Simultaneous equations By the end of this unit students will know and understand: • How to solve simultaneous equations • How to form simultaneous equations and solve • ***How to solve simultaneous equations with one linear and one quadratic*** Inequalities By the end of this unit students will know and understand: • How to solve linear inequalities • How to represent inequalities on a number line	to evaluate functions • Find the numerical value of composite functions • Form expressions for composite function • Form and use inverse functions Curves and graphs By the end of this unit students will know and understand: • Cubic graphs and how to sketch them • Reciprocal graphs and how to sketch them • ***Graphs of exponential functions*** • ***Trig curves y=cosx y=sinx, y=tanx*** • ***How to interpret the***	Constructions and loci By the end of this unit students will know and understand: • How to construct angle bisectors and perpendicular bisectors • How to construct a perpendicular to a given line from a given point • How to solve loci problems • That the perpendicular distance from a point to a line is the shortest distance to the line Proof By the end of this unit students will know and understand: • How to argue mathematically to show algebraic expressions are equivalent and		

	• Gradients and intercepts and how to interpret them Probability and probability diagrams By the end of this unit students will know and understand: • Probability and the outcome of probability experiments • Frequency trees and how to complete them • Relative frequency • Mutually exclusive events • How to calculate and interpret conditional probabilities with tree diagrams and Venn diagrams • Set notation of Venn diagrams	• How to use the inverse to solve two-part inequalities • ***Solve quadratic inequalities*** • ***Use set notation*** • ***Represent inequalities on a graph*** • Circle theorems By the end of this unit students will know and understand: • ***Circle theorems and how to calculate missing angles using them*** • ***Circle theorem proofs*** **Equation of a circle**	***gradient at a point on a curve as the instantaneous rate of change*** • ***The gradient as rate of change*** Use of calculators and Iteration By the end of this unit students will know and understand: • How to efficiently use their calculators • How to change the subject for iterative equations • ***How to find approximate solutions to equations numerically using iterations*** Vectors	use algebra to support arguments • ***Proof using algebra*** *Revision and recap*		

	Systematic listing and product rule By the end of this unit students will know and understand: • How to apply systematic listing strategies • The product rule for counting	By the end of this unit students will know and understand: • ***The equation of a circle with the centre at the origin*** • ***How to find the equation of a tangent to a circle at a given point***	By the end of this unit students will know and understand: • Addition and subtraction of vectors • Multiplication of vectors by a scalar • Vectors represented on a diagram • ***How to use vectors to construct geometric arguments and proof*** • ***How to solve problems with vectors***			
Key Vocabulary	Exact Rationalise Denominator Surd Coefficient Expand Factorise Substitute Arc Segment	Root Intercept Turning point Simultaneous Proportion Direct Inverse Cubic Reciprocal Exponential	Iteration Approximate Loci Bisector Perpendicular Vector Scalar Proof	Enlarge Reflect Rotate Translate Describe fully Invariance Stretch Function		

	Chord Cyclic quadrilateral Tangent	Gradient Centre				