Further Maths Year 11 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	Algebra 3	Coordinate geometry	Calculus	*Geometry 2*	*Reap and review*	
Ethos Links	STEM - Use of algebra in many different areas of business and applications of equations	STEM - Use of geometry in engineering and other construction areas including architecture	STEM - Use of algebra in many different areas of business and applications of equations	STEM - Use of geometry in engineering and other construction areas including architecture		
Knowledge	By the end of this unit students will know and understand: Domain and range of functions • To understand what the domain and range are of a function are • How to state the range of a function given the domain • How to state the domain and range of a given graph Composite functions	By the end of this unit students will know and understand: The distance between two points • Use Pythagoras' theorem to calculate the distance between two points The midpoint of a line joining two points • How to find the coordinates of a midpoint of a	By the end of this unit students will know and understand: Differentiation using standard results • Differentiate an equation with one or more terms • Expand or divide equations to differentiate • Use differentiation to calculate the gradient at a given point. Tangents and normal	By the end of this unit students will know and understand: Using the sine and cosine rules together • Use the sine rule and cosine rule to solve problems Lines and planes in three dimensions • Use Pythagoras in three dimensions Use the sine rule and cosine rule in three dimensions	By the end of this unit students will know and understand: Recap and review	

	• How to write a composite function involving 2 functions • How to write a composite function involving 3 functions • How to solve problems with composite functions Graphs of linear functions • Know the difference between sketching and drawing • Sketch graphs of more complex straight-line graphs Graphs of quadratic functions • Know how to plot a quadratic graph from a table of values • Understand that all quadratic graphs have a line of symmetry and find an equation for the line of symmetry Inverse functions • How to find the inverse of a function given a function • To know and understand that that when you	line segment given the coordinates of the end point • How to find the coordinates of an endpoint of a line segment given the coordinates of the midpoint • How to solve problems using midpoints and endpoints of line segments Equation of a straight line • How to use basic straight-line facts to solve problems with coordinates • How to use and apply geometry facts to straight line graphs The intersection of two lines • Work out graphically the point of intersection of two lines • Solve simultaneous equations graphically with two linear graphs Dividing a line into a given ratio • How to apply ratio to	• Use differentiation, substitution and rearranging to calculate the gradient and equation of a tangent at a given point • Use differentiation, subsitution and rearranging to calculate the gradient and equation of a normal at a given point Increasing and decreasing functions • Differentiate to show whether a function is an increasing or decreasing function The second derivative • Calculate the second derivative • Apply the second derivative to real life situations Stationary points • *Identify when the gradient of a curve is 0 to identify stationary points Classify stationary points as either*			

	graph a line and its inverse function, they are reflected in the line y=x Graphs of exponential functions • Use a table of values to draw an exponential graph • How to state the number of roots there are with multiple graphs • Solve problems with exponential graphs Graphs of functions with up to three parts in their domains • How to draw graphs with two or three parts in their domains • How to deduce the domains from a drawn graph	coordinate problems using line segments Equation of a circle • Recognising the equation of a circle • Deducing the radius and centre of a circle from the equation • Deducing the equation given the radius and centre point of a circle • Rearranging equations of circles to deduce the centre and radius Applying circle theorems to solve problems with equations of circles.	*maximums or minimums.*			
Key Vocabulary	Domain Range Composite Inverse Exponential Roots	Midpoint Endpoint Line segment Intersection Simultaneous Graphically Centre Radius	Gradient Differentiation Derivative Stationary Tangent Normal Maximum Minimum	Sine Cosine Tangent Plane Three dimensions		