The Sutton Academy

Knowledge Rich Curriculum Plan

Year 10 Higher+ Algebra 3

Lesson/Learning Sequence	Intended Knowledge: *Students will know that…*	Tiered Vocabulary	Steps to Success	Prior Knowledge: *In order to know this…*	Feedback
To learn how to find the nth term of a quadratic sequence	• Students will know how to continue a quadratic sequence and use the nth term to generate terms • Students will know how to find the nth term of a quadratic sequence. • Students will know how to solve problems involving the nth term of quadratic sequences	**Sequence** - a particular order in which related things follow each other. **Generate –** produce or create. **Linear or Arithmetic Sequence** - A number pattern which increases (or decreases) by the same amount each time **Geometric Sequence –** a sequence made by multiplying by the same value each time **Nth Term –** a formula that enables us to find any term in a sequence. The ' n ' stands for the term number **Quadratic –** An expression or equation where the highest power is 2. **Substitute –** use or add in place of	•	• Students will need to know how to find the nth term of a linear sequence • Students will need to know how to generate a sequence for a given nth term, including those in the form an^2	
To learn how to draw and interpret quadratic graphs	• Students will know how to draw quadratic graphs without a calculator • Students will know how to identify the coordinates of the turning point for a quadratic graph they have drawn • Students will know how to identify the roots for a quadratic graph that they have drawn • Students will know that the shape of a quadratic graph is called a parabola • Students will know how to find approximate and exact solutions to quadratic equations in the form $ax^2 + bx + c = d$ where d is an integer or decimal number by drawing a suitable horizontal straight line • Students will know how to identify the line of symmetry of a quadratic graph	**Quadratic –** An expression or equation where the highest power is 2. **Turning Point** – The point at which the gradient changes of a curve (the maximum or minimum point on a curve). **Root** – A solution to an equation where a line or curve crosses the x-axis. **Parabola –** the U or ∩ shape of a quadratic graph	•	• Students will need to know how to substitute both positive and negative numbers into expressions involving squaring • Students will need to know how to draw graphs in the form y = a, x = a	

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To learn how to draw and recognise quadratic, cubic and reciprocal graphs	• Students will know how to recognise and draw cubic functions. • Students will know how to recognise and draw graphs of reciprocal functions • Students will know how to recognise and sketch graphs of exponential functions. • Students will know how to complete a table of values and plot a cubic function. • Students will know how to recognise the shape of different graphs and match equations to sketches.	**Cubic –** Of the third power, order, or degree. In maths a cubic function is one involving a cubed algebraic term but no other power higher than 3. **Reciprocal –** The reciprocal of a number is: 1 divided by the number **Exponential –** a relation of the form $y = a^x$	•	• Students will need to know how to substitute numbers into formulae involving cubes and fractions • Students will need to know how to convert a fraction to a decimal	
To learn how to find turning points by completing the square	• Students will know that we can find the turning point of a quadratic by writing it in the form $(x \pm a)^2 \pm b$ • Students will know that the coordinates of the turning point of a quadratic written in the form $(x + a)^2 + b$ is $(-a, b)$	**Turning Point** – The point at which the gradient changes of a curve (the maximum or minimum point on a curve).	•	• Students need to know how to expand and simplify a squared bracket	
To learn how to factorise and solve quadratics	• Students will know how to factorise and solve quadratic equations in the form $ax^2 + bx + c = 0$ • Students will know that in order to factorise and solve quadratic equations they must be equal to zero. • Students will know how to rearrange equations to make them equal to zero before factorising and solving them • Students will know how to form and solve quadratic equations where the coefficient of x^2 is 1	**Factorise –** put back into brackets by bringing common factors outside **Quadratic –** involving a squared algebraic term but no other power higher than 2	•	• Students need to be able to factorise quadratics	
To learn how to solve quadratics using the quadratic formula	• Students will know that the quadratic formula is $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$ • Students will know that we use the quadratic formula when a quadratic cannot be factorised • Students will know how to identify the values for a, b and c from a quadratic equation including where the equation is not necessarily in the order $ax^2 + bx + c$ • Students will know how to substitute the values for a, b and c into the quadratic formula to solve the corresponding quadratic equation • Students will know that in order to solve quadratic equations they must be equal to zero.	**Formula –** A mathematical relationship or rule expressed in symbols.	•	• Students need to be able to use a calculator efficiently • Students need to be able to substitute numbers into formulae	

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	• Students will know how to rearrange equations to make them equal to zero before using the quadratic formula to solve them • Students will know how to form and solve quadratic equations using the quadratic formula				
To learn how to form and solve quadratic equations	• Students will know how to form and solve quadratic equations involving shape using either the quadratic formula or factorisation		•	• Students will need to know how to solve quadratic equations • Students will need to know how to form and solve linear equations	
To learn how to solve quadratic inequalities	• Students will know how to solve quadratic inequalities	**Quadratic –** involving a squared algebraic term but no other power higher than 2 **Inequality –** a symbol which makes a non-equal comparison between two numbers or other mathematical expressions e.g. >, <, ≥ and ≤	•	• Students will need to know how to solve quadratic equations • Students will need to know how to sketch quadratics showing the roots	
To learn how to solve quadratic simultaneous equations graphically	• Students will know how to solve quadratic simultaneous equations by identifying the points of intersection between a straight line and a curve • Students will know how to solve quadratic simultaneous equations by drawing the curve and the straight line and identifying the points of intersection • Students will know how to solve a different quadratic equation to that drawn by deriving and drawing a suitable straight line on a quadratic graph	**Quadratic –** involving a squared algebraic term but no other power higher than 2 **Simultaneous –** occurring, operating, or done at the same time. **Simultaneous equations –** equations involving two or more unknowns that are to have the same values in each equation. **Linear Equation –** an equation between two variables that can be	•	• Students will need to know how to draw quadratic graphs • Students will need to know how to draw straight line graphs	

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		written in the form y=mx+c. Linear equations give a straight line when plotted on a graph.			
To learn how to use iteration to estimate solutions to equations	• Students will know how to show that a solution to an equation lies between two integers • Students will know how to rearrange an existing formula to give an iteration formula • Students will know how to use iteration to find approximate solutions to equations, for simple equations in the first instance, then quadratic and cubic equations.	**Iteration** – the repetition of a process	•	• Students will need to know how to substitute into formulae • Students will need to know how to rearrange formulae	
To learn how to use iteration to estimate solutions to equations	• Students will know how to use iteration to find approximate solutions to equations, for simple equations in the first instance, then quadratic and cubic equations. • Students will be able to use iteration from worded scenarios.		•	•	
To learn how to solve quadratic simultaneous equations	• Students will know how to solve quadratic simultaneous equations algebraically using substitution.		•	• Students will need to know how to solve linear simultaneous equations algebraically • Students will need to know how to solve quadratic equations	
To consolidate my understanding of solving quadratic simultaneous equations	• Students will know how to solve quadratic simultaneous equations algebraically using substitution.		•	• Students will need to know how to solve quadratic simultaneous equations	