The Sutton Academy

Knowledge Rich Curriculum Plan

Year 11 Higher+ Algebra 4

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 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. • Students will know how to use iteration with simple converging sequences. • Students will know that converging sequences if approaches a limit.	**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 solve real life problems using iterative processes	• Students will know how to use iterative processes to solve real life problems involving exponential increase or exponential decay	**Exponential –** a relation of the form $y = a^x$ **Exponential decay –** the process of reducing an amount by a consistent percentage rate over a period of time.	•	• Students will need to know how to solve problems involving compound interest and depreciation	
To learn how to interpret function notation and substitute into functions and composite functions	• Students will know how to interpret function notation • Students will know how to substitute numbers into functions, for example f(2), g(-3) etc. • Students will know how to substitute numbers into composite functions, for example fg(2), gf(-3), ff(4) etc.	**Function –** a relation or expression involving one or more variables. In maths we often call function f(x) or g(x) etc.	•	• Students will need to know how to substitute into formulae	
To learn how to find composite and inverse functions	• Students will know how to form a composite function for example fg(x), gg(x), gf(x) etc. • Students will know that to find an inverse function we write the original function equal to y, rearrange to make x the subject and then substitute x back into the place of y • Students will know how to find inverse functions • Students will know how to find the inverse of a composite function	**Composite** - made up of several parts or elements. **Composite function** - A function made of other functions, where the output of one is the input to the other. **Inverse** - opposite **Inverse function** - the inverse function of a function f is a function that undoes the operation of f.	•	• Students will need to know how to expand brackets and simplify algebraic expressions	

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To learn how to form and solve equations from functions	• Students will know how to solve equations involving functions, for example solve f(x) = 3 including where f(x) is a quadratic • Students will know how to solve equations such as f(x) = g(x) • Students will know how to form composite functions and then solve equations involving them • Students will know how to find inverse functions and solve equations involving them • Students will know how to solve more complex problems involving composite and inverse functions		•	• Students will need to know how to solve linear equations including those with unknowns on both sides	
To investigate how and why functions are transformed Boost topic	• Students will know how to find functions of f(x + a) and f(x – a), sketch the resulting graph and understand why a function in the form f(x + a) is translated 'a' units to the left and why f(x – a) is translate 'a' units the right • Students will know how to find functions of f(-x) and -f(x), sketch the resulting graph and understand why a function in the form f(-x) is reflected in the y-axis and why -f(x) is reflected in the x-axis		•	•	
To learn how to transform functions	• Students will know that f(x) + *a* means the whole graph is translated by *a* in the positive *y* direction (up) • Students will know that f(x) – *a* means the whole graph is translated by *a* in the negative *y* direction (down) • Students will know that f(x + *a*) means the whole graph is translated by a in the negative *x* direction (left) • Students will know that f(x – *a*) means the whole graph is translated by a in the positive *x* direction (right) • Students will know that –*f*(*x*) means every positive *y* value is made negative and every negative *y* is made positive. As a result, the whole graph is reflected in the x-axis. • Students will know that *f*(–*x*) means every positive *x* value is made negative and every negative *x* is made positive. As a result, the whole graph is reflected in the y-axis. • Students will know how to transform functions by a single transformation	Transform – change Transformation – in maths, a transformation is a process that manipulates a polygon or other two-dimensional object on a plane or coordinate system Translation – the process of moving something from one place to another.	•	• Students will need to know how to translate shapes • Students will need to know how to reflect shapes in the x-axis and y-axis	

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	• Students will know how to transform functions involving a combination of transformations • Students will know the effect of transformations on key coordinates for a function • Students will know how to transform trigonometric functions and will know how to describe their effect on key coordinates				