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**Knowledge Rich Curriculum Plan**

Year 10 Intermediate – Algebra 4



| **Lesson Objective** | **Intended Knowledge:**  *Students will know that…* | **Tiered Vocabulary** | **Prior Knowledge:**  *In order to know this, students need to already know that…* | **Assessment** |
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| **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 | **Quadratic –** involving a squared algebraic term but no other power higher than 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 an2 |  |
| **To learn how to draw quadratic graphs** | * Students will know how to recognise graphs of quadratic functions * Students will know how to generate points and plot graphs of quadratic functions with a calculator | **Quadratic –** An expression or equation where the highest power is 2.  **Parabola –** the U or ∩ shape of a quadratic graph | * Students will know how to substitute positive and negative integers into formulae involving squared terms |  |
| **To learn how to draw and interpret quadratic graphs** | * Students will know how to identify the line of symmetry of a quadratic graph * Students will know how to find approximate and exact solutions to quadratic equations by identifying the roots of a graph * Students will know how to solve quadratics in the form ax2 + bx + c = d by drawing the graph of y = d and reading off the values for x * Students will know how to identify the turning point for a drawn quadratic graph | **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. | * Students will know how to generate points and plot graphs of quadratic functions |  |
| **To learn how to recognise and draw quadratic, cubic and reciprocal graphs** | * Students will know how to recognise and sketch simple cubic functions. * Students will know how to recognise and sketch graphs of the reciprocal function y=1/x with x ≠ 0 * Students will know how to recognise and sketch graphs of exponential functions. * Students will know how to complete a table of values and plot reciprocal graphs with and without a calculator. * Students will know how to complete a table of values and plot a cubic function. * Students will know how to interpret graphs of simple cubic functions, including finding solutions to cubic equations. * 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 = ax  **Function –** a relation or expression involving one or more variables  **Quadrant -** any of the four quarters of something when it is divided by two real or imaginary lines that intersect each other at right angles. | * Students will know how to substitute positive and negative numbers into formulae from mathematics. * Students will know how to plot coordinates in all four quadrants. |  |
| **To learn how to solve quadratics by factorising** | * Students will know how to factorise and solve quadratic equations in the form  ax2 + bx + c = 0 where a = 1 * 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 x2 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 where the co-efficient of x2 is 1 |  |
| **To learn how to solve quadratics using the quadratic formula** | * Students will know that the quadratic formula is * 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 ax2 + 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. * 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 | **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 |  |