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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
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| **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
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| **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
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| **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.
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| **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
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| **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 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
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