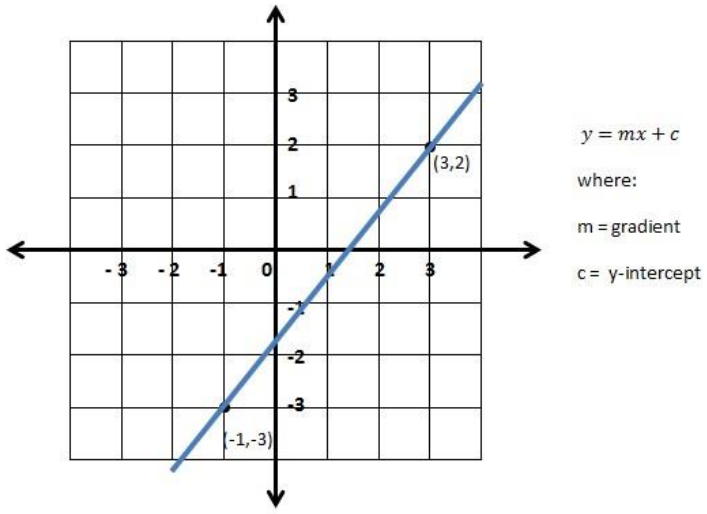
Patterns and relationships

Term	Definition	Illustration
Cubic numbers	When a whole number is multiplied by itself once, and then again, the result is a cubic number. This process is called **cubing** a number. It results in the number being **cubed**. To indicate this process, a power of 3 is used.	The first three cubic numbers are 1, 8, and 27 because: $1^3 = 1 \times 1 \times 1 = 1$ $2^3 = 2 \times 2 \times 2 = 8$ $3^3 = 3 \times 3 \times 3 = 27$ For this last example we would say "3 cubed is 27".
Equation of a straight line	The relationship between a collection of points which can be plotted to make a straight line can generally be given as $y = mx + c$. This line will have a gradient equal to m and will cross the y axis at the point $(0, c)$. Vertical lines are collections of points that share the same x coordinate and so are given by the equation $x = a$ where $(a, 0)$ is the point at which the line crosses the x axis. Horizontal lines are collections of points that share the same y coordinate and so are given by the equation $y = a$ where $(0, a)$ is the point at which the line crosses the y axis.	

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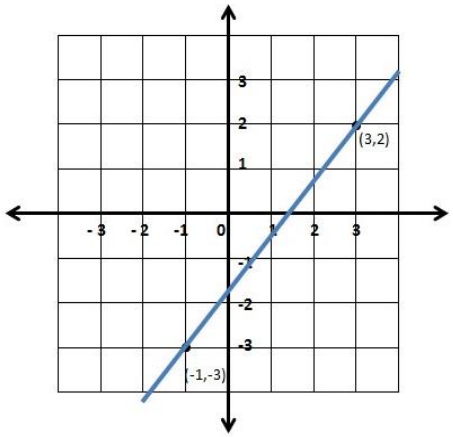
Fibonacci sequence	Named after Italian mathematician Leonardo of Pisa. The first two terms in the sequence are 0 and 1. Each new term is found by adding the two previous terms. There are many places in nature where Fibonacci sequences occur.	The Fibonacci sequence begins 0, 1, 1, 2, 3, 5, 8, 13, 21, …
Gradient	The rate at which vertical height changes with respect to horizontal distance covered. Gradients can be recorded numerically as a fraction, decimal fraction or percentage.	 The line opposite rises 5 units whilst moving a horizontal distance of 4 units. Its gradient can be written as $\frac{5}{4}$.
Sequence	A list of numbers that are linked by a rule. Learners should be able to spot simple patterns to continue a sequence.	3, 6, 12, 24, … The numbers double 14, 11, 8, 5, …. The numbers decrease by 3

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Square numbers	When a whole number is multiplied by itself the result is a square number. This process is called **squaring** a number. It results in the number being **squared**. To indicate this process, a power of 2 is used.	The first three square numbers are 1, 4, and 9 because: $1^2 = 1 \times 1 = 1$ $2^2 = 2 \times 2 = 4$ $3^2 = 3 \times 3 = 9$ For this last example we would say "3 squared is 9".
Triangular numbers	Numbers generated using the sequence 1 1 + 2 1 + 2 + 3 1 + 2 + 3 + 4 and so on. Triangular numbers of items can be arranged in a triangle.