

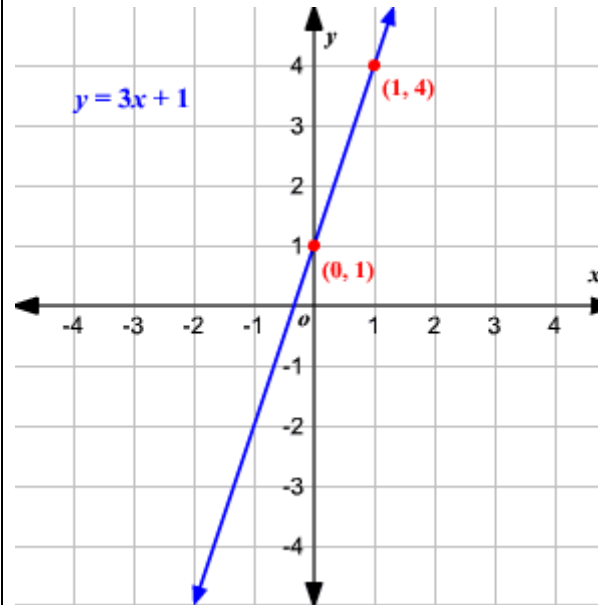
Key Vocabulary

Equation	A mathematical statement containing an equals sign Eg. $3x + 4 = 14$
Operation	A mathematical procedure used to solve something
Solve	Work out an answer
Solution	The answer to a problem
Brackets	A pair of symbols used to enclose part of a mathematical expression Eg $3(x + 2)$
Substitute	To swap a variable for a number
Linear graph	A graph that looks like a straight line
Gradient	How steep the graph is
y-intercept	Where the graph crosses the y axis
Quadratic graph	A graph of an expression where the highest power is $x^2$

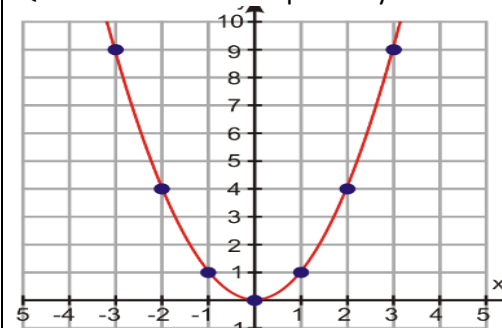
Key facts / Diagrams

All straight lines have the equation  $y = mx + c$

Example  
 $Y = 3x + 1$



Quadratics have the equation  $y = x^2 + a$



Common misconceptions

- When plotting linear graphs some pupils may draw a line segment that stops at the two most extreme points plotted
- Some pupils may think that a sketch is a very rough drawing. It should still identify key features, and look neat, but will not be drawn to scale
- Some pupils may think that a positive gradient on a distance-time graph corresponds to a section of the journey that is uphill
- Some pupils may think that the graph  $y = x^2 + c$  is the graph of  $y = x^2$  translated horizontally.

Worked examples

Balancing method

$$8a - 5 = 11$$

$$+5 \quad +5$$

$$8a = 16$$

$$+8 \quad +8$$

$$a = 2$$

Function machine method

$$8a - 5 = 11$$

$$a \rightarrow \times 8 \rightarrow -5 \rightarrow 11$$

$$2 \leftarrow +8 \leftarrow +5 \leftarrow 11$$

$$a = 2$$

Balancing method

$$10 + 6y = 34$$

$$-10 \quad -10$$

$$6y = 24$$

$$\div 6 \quad \div 6$$

$$y = 4$$

Function machine method

$$10 + 6y = 34$$

$$y \rightarrow \times 6 \rightarrow +10 \rightarrow 34$$

$$4 \leftarrow \div 6 \leftarrow -10 \leftarrow 34$$

$$y = 4$$

Balancing method

$$\frac{x}{12} - 5 = 4$$

$$+5 \quad +5$$

$$\frac{x}{12} = 9$$

$$\times 12 \quad \times 12$$

$$x = 108$$

Function machine method

$$\frac{x}{12} - 5 = 4$$

$$x \rightarrow \div 12 \rightarrow -5 \rightarrow 4$$

$$108 \leftarrow \times 12 \leftarrow +5 \leftarrow 4$$

$$x = 108$$

$$4x + 3 = 2x + 13$$

$$-2x \quad -2x$$

$$2x + 3 = 13$$

$$-3 \quad -3$$

$$2x = 10 \qquad x = 5$$