Y9 Maths Knowledge Organiser Topic 11: Linear and Conversion Graphs

What must I be able to do?

New content:

- ☐ Work out the equations of horizontal and vertical lines
  - ➢ Sparx M797
- ☐ Plot a linear graph from its equation using a table, gradient/intercept and coverup method
  - ➢ Sparx M932
- ☐ Work out the gradient of a straight line
  - ➢ Sparx M544
- ☐ Convert from one unit to another unit by using a conversion graph
  - ➢ Sparx M843, M771
- ☐ Draw and interpret information, including gradients, from graphs of real-life situations
  - ➢ Sparx M888
- ☐ Work out the equation of a straight line from a graph
  - ➢ Sparx M544

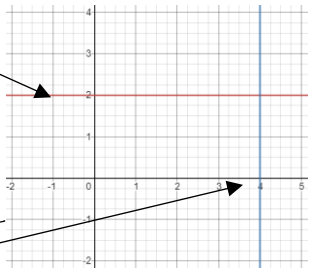
Key vocabulary

Horizontal	A left-right direction.
Vertical	An up-down direction.
Linear graph	A linear equation with 2 variables, usually x and y. When plotted it will form a straight line.
Gradient	The steepness of a graph.
Intercept	The point at which a graph crosses the y-axis.

Horizontal and vertical lines

Horizontal: y = constant

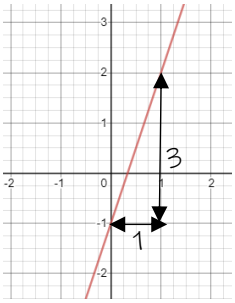
e.g. y=2



Vertical: x = constant

e.g. x=4

Finding the equation of a graph



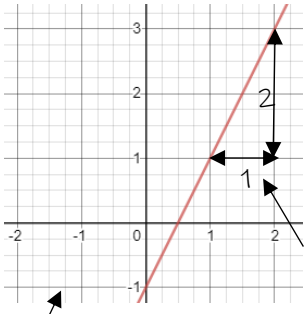
The general form of the equation of a straight line graph is y = mx + c where m is the gradient and c is the y-intercept.

Gradient is 3 ÷ 1 = 3 so m = 3

It crosses at (0, -1) so c = -1

So the equation is y = 3x - 1

Calculating the gradient



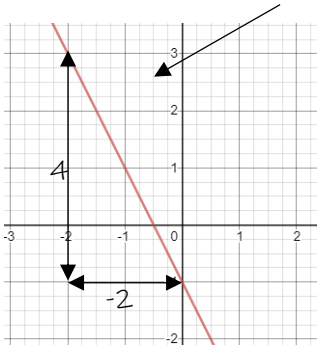
Draw a right angled triangle between 2 points.

The gradient equals: change in y / change in x

e.g. 2 ÷ 1 = 2

The gradient is 2

This graph slopes up from left to right so the gradient is positive. If it sloped up from right to left the gradient would be negative.



e.g. 4 ÷ -2 = -2

The gradient is -2

Plotting graphs

From a table – substitute each x value into the equation to generate each coordinate to plot. e.g. y =2x + 1

When x = 0, y = 2 x 0 + 1 = 1 When x = 2, y = 2 x 2 + 1 = 5

x	0	1	2	3
y	1	3	5	7

When x = 1, y = 2 x 1 + 1 = 3 When x = 3, y = 2 x 3 + 1 = 7

Coordinates to plot at (0, 1), (1, 3), (2, 5) and (3, 7). Join with a straight line.

Gradient/intercept – first ensure the equation of the line is in the form y = mx + c. e.g. y = 4x + 2. We know m = 4 and c = 2.

Plot the intercept at (0, 2). As the gradient is 4, it will travel 4 units upwards for each unit to the right. So 4 units up and 1 to the right of (0, 2) is (1, 6). The next is (2, 10). Plot and join up with a straight line.

Not the intercept as not in the form y = mx + c

Cover up – similar to table but used when in the form ax + by = c.

e.g. 3x + 2y = 6.

Put x = 0. So 2y = 6 Therefore y = 3

x	0	2
y	3	0

Put y = 0. So 3x = 6. Therefore x = 2

Gives the coordinates (0, 3) and (2, 0)