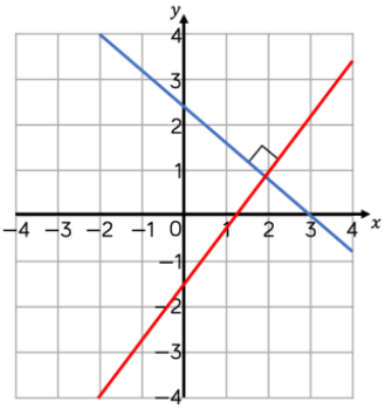
YEAR 11 — GRADIENTS & LINES

By the end of this unit you should be able to:	MathsWatch clip	Video tutorial
• Find equations of lines parallel to the axis	05	
• Plot straight lines	96	
• Interpret y = mx + c		Corbett
• Find the equation of a straight line:		
• i) from a graph	159a	Corbett
• ii) given one point and a gradient	159b	
• iii) given two points	159b	Corbett
• Determine whether a point is on a line		
• Solve linear simultaneous equations graphically	140	MathsGenie
• Recognise when straight lines are perpendicular (H)	208	
• Find the equations of perpendicular lines (H)	208	MathsGenie

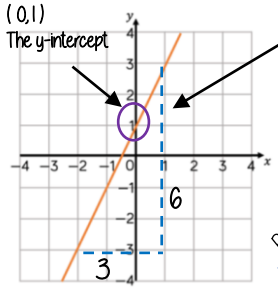


Keywords

Parallel: straight lines that never meet (equal gradients)
Horizontal: a straight line which goes from side to side, parallel to the x-axis
Vertical: a straight line which goes up and down, parallel to the y-axis
Intercept: the point where a line crosses the axis of a graph
Gradient: the steepness (or slope) of a line. A negative gradient means the line slopes downhill
Substitute: put numbers in place of letters to find the value of an expression
Reciprocal: the reciprocal of a number is 1 divided by that number.

Some (but not all) key points:

Find the equation from a graph



$$y = 2x + 1$$

The direction of the line indicates a positive gradient

Positive gradients

Negative gradients

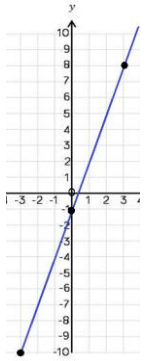
Plotting y = mx + c graphs

$y = 3x - 1$ → 3 x the x coordinate then – 1

x	-3	0	3
y	-10	-1	8

Draw a table to display this information

This represents a coordinate pair (-3, -10)



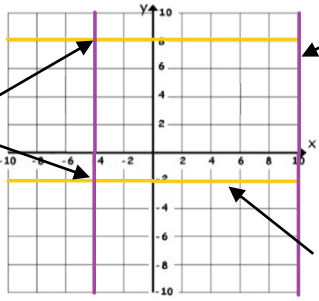
You only need two points to form a straight line

Plotting more points helps you decide if your calculations are correct (if they do make a straight line)

Remember to join the points to make a line

Lines parallel to the axes

R



Intersection points

All the points on this line have a x coordinate of 10

'a' can be ANY positive or negative value including 0

Lines parallel to the **y axis** take the form **x = a** and are **vertical**

Lines parallel to the **x axis** take the form **y = a** and are **horizontal**

All the points on this line have a y coordinate of -2

e.g (3, -2) (7, -2) (-2, -2) all lay on this line because the y coordinate is -2