Equation of a straight line in intercept form

Year 12 Further Maths
Units 3 and 4

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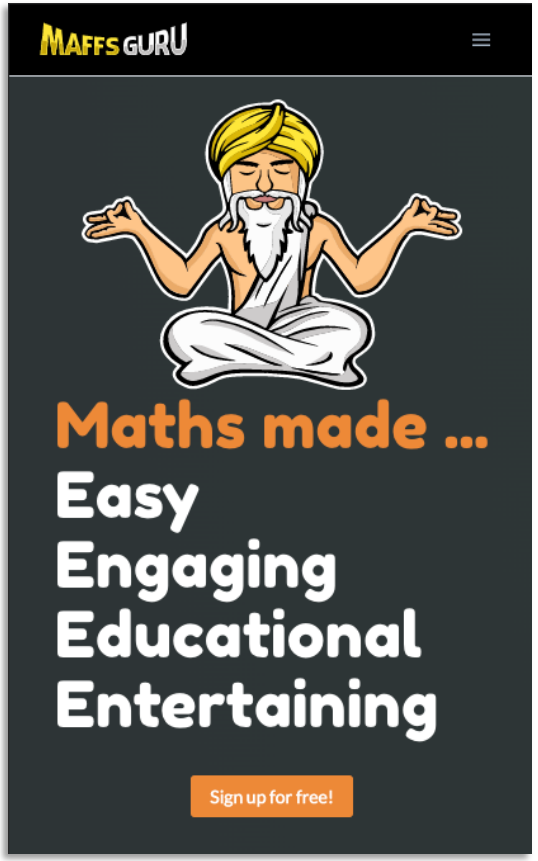

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Learning Objectives

By the end of the lesson I would hope that you have an understanding and be able to apply to questions the following concepts:

- Understand how to sketch the graph of a line given in intercept form
- Understand how find the equation of a line given two points

$$y = mx + c$$

$$4x + 2y = 8$$

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Recap

Much of the work in this lesson has already been covered in previous lessons. However, it's useful to remember that there are two forms in which we can write the equation of a straight line

$$y = mx + c$$

$$ax + by = c$$

$2x + 4y = 8$

$3x - y = 6$

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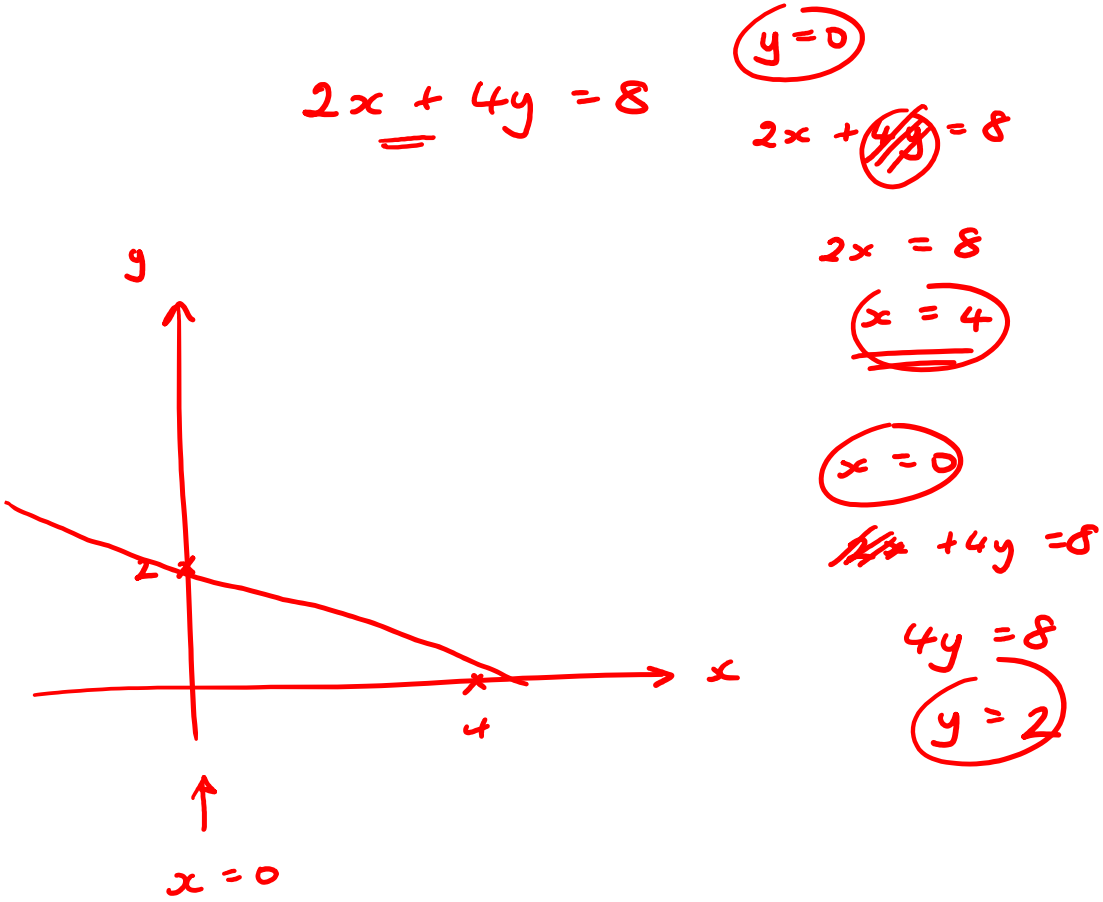
Intercept Form: A review

The minimum number of points we need to be able to draw a straight-line graph is two.

Finding the axis intercepts of an equation is simple.

We know, at the axis intercepts that either the x-value is zero or the y-value is zero.

This makes substituting into an equation really simple as we know anything multiplied by zero is zero! Hence, the term disappears making it easy for us to "solve" for the unknown pronumeral.



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Intercept Form: An example

Sketch the graph of $2x + 4y = 10$.

$x = 0$

$2x + 4y = 10$

$4y = 10$

$y = \frac{10}{4}$

$y = \frac{5}{2}$ (2.5)

$(0, 2.5)$

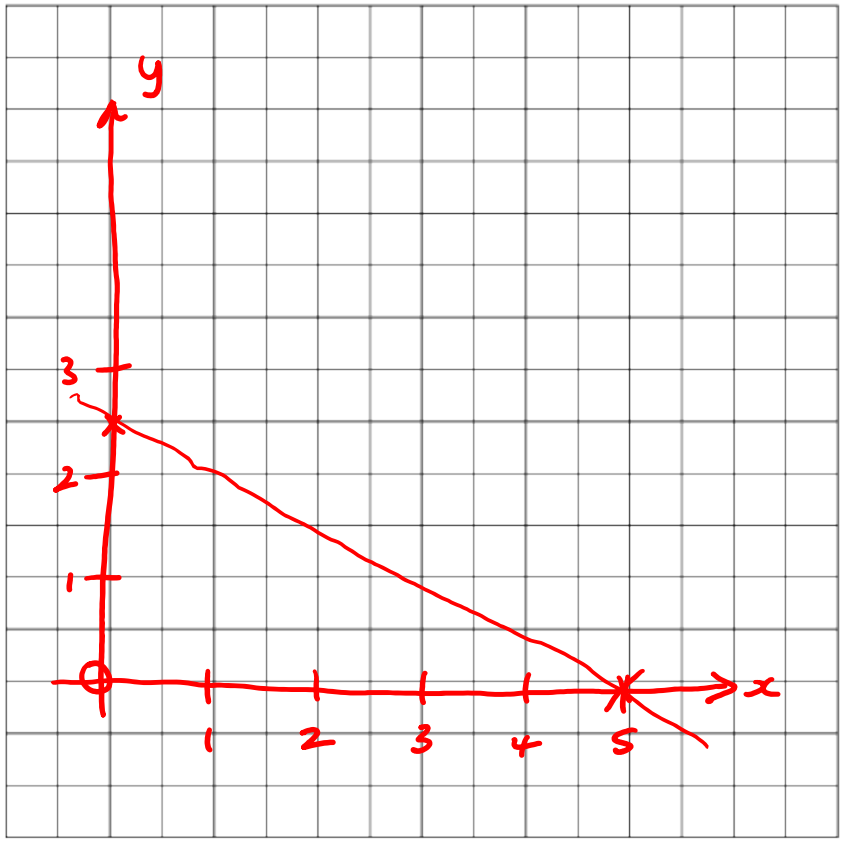
$y = 0$

$2x + 4y = 10$

$2x = 10$

$x = 5$

$(5, 0)$



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Examples have been extracted, with permission, from the Cambridge Further Mathematics Units 3 and 4 Textbook

Example: When given two points

Find the equation of the line passing through the points $A(2,5)$ and $B(6,8)$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{8-5}{6-2}$$

$$= \frac{3}{4}$$

$$y - y_1 = m(x - x_1)$$

$$y - 5 = \frac{3}{4}(x - 2)$$

$\div 4$

$$4y - 20 = 3(x - 2)$$

$$4y - 20 = 3x - 6$$

$$4y = 3x - 6 + 20$$

$$4y = 3x + 14$$

$$-3x + 4y = 14$$

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Thanks for watching

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