Equation of a Straight Line

Starter

1. **(Review of last lesson)**
Find the gradient of the line in the diagram.

2. **(Review of last lesson)**
Find the gradient of the line passing through the points $(-5, 2)$ and $(9, -8)$.

3. **(Review of last lesson)** Here are the gradients of five lines: $-3,\ 2,\ \frac{1}{4},\ -1,\ 1.8.$
Put them in order of increasing steepness.

Notes

E.g. 1 The equation of the straight line is given by $y = mx + c$. What does the m and the c represent in the equation? Use one of the geogebra links below to investigate how straight lines change when the values of m and c change.

Geogebra 1: **y = mx + c**
Geogebra 2: **y = mx + c (more sophisticated)**

Copy and complete these statements:

The value of m changes the _____.
The value of c changes _____.

Equation of a straight line

The equation of a straight is of the form $y = mx + c$ where m is the gradient and c is the $y-$intercept

N.B. The $y-$intercept is where the line crosses the $y-$axis

E.g. 2 Do Gradients 1-6 of **Geogebra 1:** **Draw the line given the equation**
Move the point A up and down the $y-$ axis and point B around the grid until the line matches the given equation
Hint: Think what the values of m and c are.

Geogebra 2: **Draw the line given the equation**
Better with a teacher — blue points need to be on certain values.

Sometimes the equation of a straight line is not given in the form $y = mx + c$ — in such case rearrange the equation to get $y = \ldots$

E.g. 3 State the gradient and $y-$intercept of these lines:

(a) $y = 4x + 7$ (b) $y = 9 - 2x$ (c) $3x + y = 8$

(d) $y - 5x + 11 = 0$ (e) $3y = x - 6$ (f) $5x - 4y = 12$

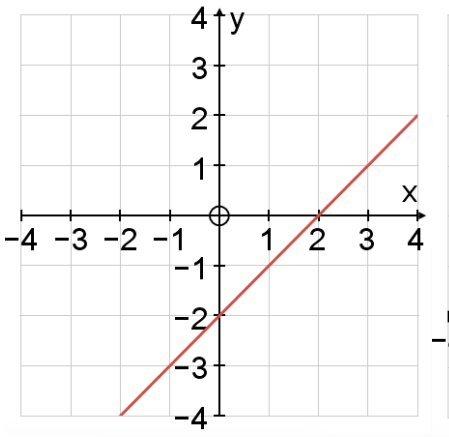
Hint: make sure the equation is in the form $y = mx + c$ — if not, you will need to rearrange the equation.

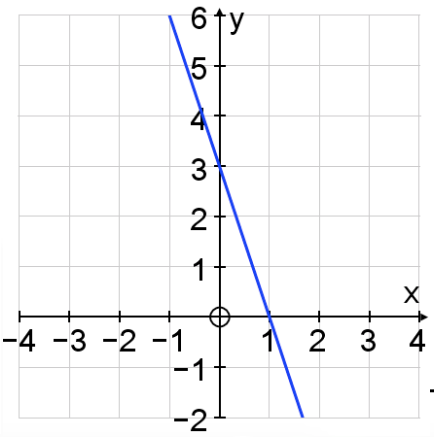
Working: (a) Gradient (coefficient of x) $= 4$

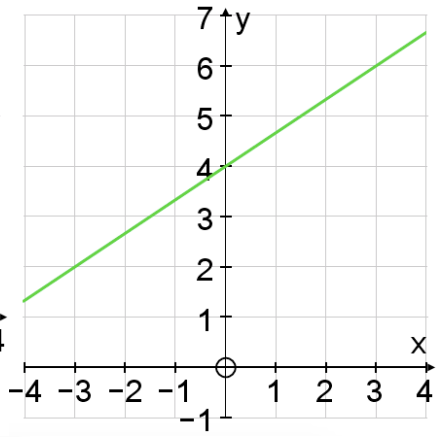
$y-$intercept (constant term) $= 7$

E.g. 4 Find the equation of these straight lines.

(a) (b) (c)







Hint: when calculating the gradient, choose points whose coordinates are integers.

Video: y = mx + c

Video: Finding the equation of a straight line

Solutions to Starter and E.g.s

Exercise

Equation of straight line: CIMT Y8B p48 Ex 14.4 Qu 4, 5, 6b, 7, 8

Summary

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The $y-$intercept is where the line crosses the $y-$axis

Sometimes the equation of a straight line is not given in the form $y = mx + c$ — in such case rearrange the equation to get $y = \ldots$