

Equation of a Straight Line

Starter

1. (Review of last lesson)
Which of these straight lines are parallel? $y = 3x - 2$ $y = 4x - 2$ $y = 6 + 3x$
2. How many points do we need to define a straight line?
3. Find two points on each of the following lines:
(a) $y = 3x$ (b) $y = 2x + 5$ (c) $y = 9 - 4x$

Notes

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. 1 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.

Working: Click on 'Check Answer' to check your answers.

Geogebra 2: [Draw the line given the equation](#)

Better with a teacher — blue points need to be on certain values.

E.g. 2 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) $5x - 4y = 12$

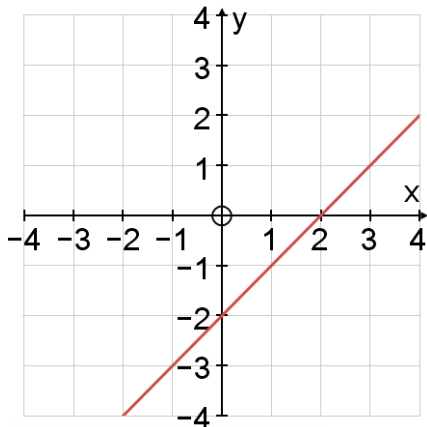
Hint: make sure the equation is in the form $y = mx + c$ — if not, you will need to rearrange the equation.

Working: (a) Gradient (coefficient of x) = 4
 y -intercept (constant term) = 7

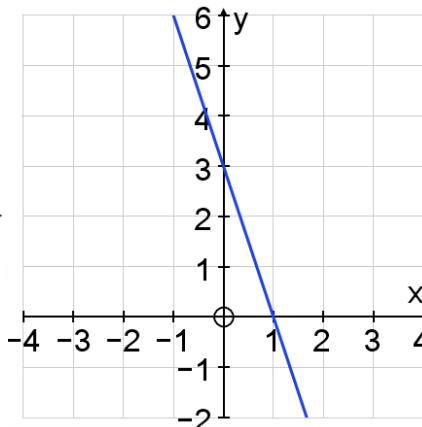
(c) Rearrange $3x + y = 8$ to get y on its own: $y = 8 - 3x$
Gradient (coefficient of x) = -3
 y -intercept (constant term) = 8

E.g. 3 Find the equation of these straight lines.

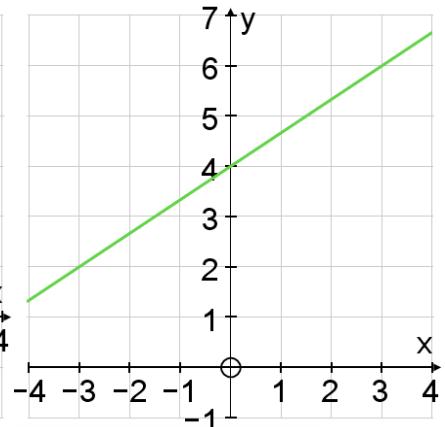
(a)



(b)



(c)



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

Working: (a) The y -intercept is $-2 \Rightarrow y = mx - 2$
The gradient between the points $(0, -2)$ and $(2, 0)$ is 1 .
The equation of the line is $y = x - 2$

Video: [y = mx + c](#)

[Solutions to Starter and E.g.s](#)

Exercise

p48 Ex 14.4 Qu 4, 5, 6b, 7, 8

Summary

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

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

[Textbook answers \(only available during a lockdown\)](#)