

Gradient of a straight line

Starter

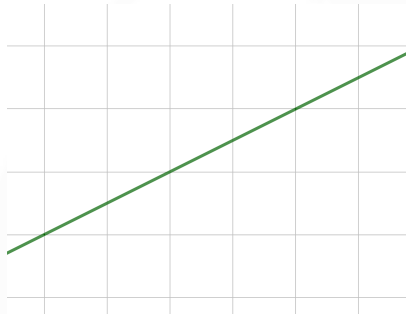
1. (Review of last lesson) Find three points that lie on the line $y = 2 - 7x$.

Working: For example:

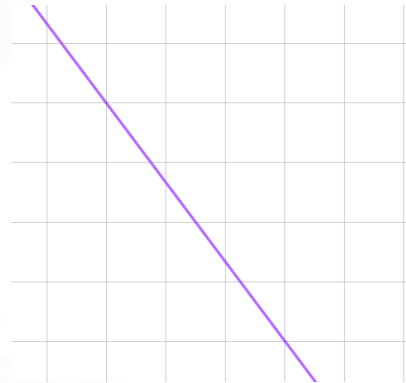
Let $x = 0$	\Rightarrow	$y = 2 - 7 \times 0 = 2$	$\therefore (0, 2)$
Let $x = 2$	\Rightarrow	$y = 2 - 7 \times 2 = -12$	$\therefore (2, -12)$
Let $x = 4$	\Rightarrow	$y = 2 - 7 \times 4 = -26$	$\therefore (4, -26)$

E.g. 1 Find the gradients of these lines:

(a)

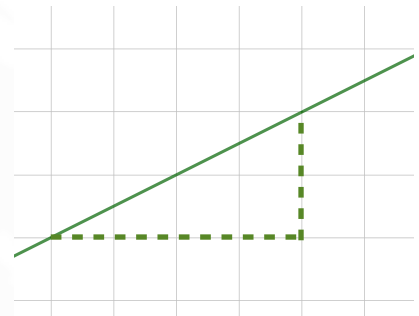


(b)

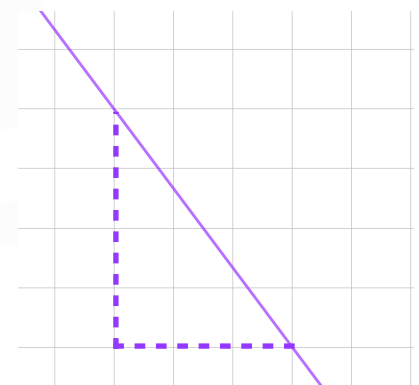


Working:

(a) Gradient = $\frac{\text{rise}}{\text{run}} = \frac{2}{4} = \frac{1}{2}$



(b) Gradient = $\frac{\text{rise}}{\text{run}} = \frac{-4}{3} = -\frac{4}{3}$



E.g. 2 Find the gradient of the line passing through the following pairs of points:

(a) $(-1, 3)$ and $(2, 5)$

(b) $(-6, 1)$ and $(9, -7)$

Working: (a) **Label the points:** $(-1, 3)$ $(2, 5)$
 (x_1, y_1) (x_2, y_2)
Sub. into formula: Gradient = $\frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - 3}{2 - -1} = \frac{2}{3}$

(b) **Label the points:** $(-6, 1)$ $(9, -7)$
 (x_1, y_1) (x_2, y_2)
Sub. into formula: Gradient = $\frac{y_2 - y_1}{x_2 - x_1} = \frac{-7 - 1}{9 - -6} = \frac{-8}{15} = -\frac{8}{15}$

E.g. 3 Find the value of a if the line joining the points $(3a, 4)$ and $(a, -3)$ has a gradient of 2.

Working: **Label the points:** $(a, -3)$ $(3a, 4)$
 (x_1, y_1) (x_2, y_2)
Gradient = $\frac{y_2 - y_1}{x_2 - x_1}$: $\frac{4 - -3}{3a - a} = 2 \Rightarrow \frac{7}{2a} = 2$
 $\Rightarrow 7 = 4a \Rightarrow a = \frac{7}{4}$

Video: [Gradient of a line](#)
[Gradient between 2 points](#)

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

Exercise

- 9-1 class textbook: p194 M6.12 Qu Qu 1-6
- A*-G class textbook: p177 M6.10 Qu 1-6
- 9-1 homework book: p69 M6.12 Qu 1-5
- A*-G homework book: p51 M6.10 Qu 1-5