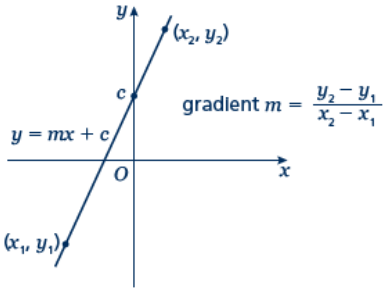
Pearson Edexcel

# Gradients given two points

**A LEVEL LINKS**
**Scheme of work:** 2a. Straight-line graphs, parallel/perpendicular, length and area problems

## Key points

- A straight line has the equation $y = mx + c$, where $m$ is the gradient and $c$ is the $y$-intercept (where $x = 0$).
- The equation of a straight line can be written in the form $ax + by + c = 0$, where $a$, $b$ and $c$ are integers.
- When given the coordinates $(x_1, y_1)$ and $(x_2, y_2)$ of two points on a line the gradient is calculated using the formula $m = \dfrac{y_2 - y_1}{x_2 - x_1}$




**Example 1** Work out the gradient of the line joining (2, 4) and (8, 7).

| | |
|---|---|
| $x_1 = 2$, $x_2 = 8$, $y_1 = 4$ and $y_2 = 7$<br>$m = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{7-4}{8-2} = \dfrac{3}{6} = \dfrac{1}{2}$<br><br>$m = \dfrac{1}{2}$ | Substitute the coordinates into the equation $m = \dfrac{y_2 - y_1}{x_2 - x_1}$ to work out the gradient of the line. |

## Practice questions

**1** Work out the gradient of the line joining each p[air of coordinates.

**a** (4, 5), (10, 17) **b** (0, 6), (–4, 8)

**c** (–1, –7), (5, 23) **d** (3, 10), (4, 7)

## Answers

**1** **a** $m = 2$ **b** $m = -\dfrac{1}{2}$

**c** $m = 5$ **d** $m = -3$