

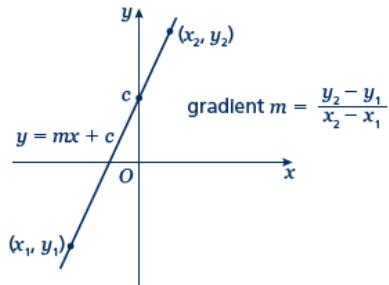
# Straight line equations

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



## Practice questions

- Write these lines in the form  $ax + by + c = 0$ .
 

|   |                                  |
|---|----------------------------------|
| <b>a</b> $y = 3x + 5$                     | <b>b</b> $y = -\frac{1}{2}x - 7$ |
| <b>c</b> $2y = 4x - 3$                    | <b>d</b> $x + y = 5$             |
| <b>e</b> $y = \frac{1}{2}x - \frac{3}{4}$ | <b>f</b> $3y = \frac{2}{3}x - 2$ |
- Find, in the form  $ax + by + c = 0$  where  $a$ ,  $b$  and  $c$  are integers, an equation for each of the lines with the following gradients and  $y$ -intercepts.
 

|  |  |
|--|--|
| <b>a</b> gradient $-\frac{1}{2}$ , $y$ -intercept $-7$ | <b>b</b> gradient $2$ , $y$ -intercept $0$     |
| <b>c</b> gradient $\frac{2}{3}$ , $y$ -intercept $4$   | <b>d</b> gradient $-1.2$ , $y$ -intercept $-2$ |

## Answers

1    a     $3x - y + 5 = 0$     b     $x + 2y + 14 = 0$

  c     $4x - 2y - 3 = 0$     d     $x + y - 5 = 0$

  e     $2x - 4y - 3 = 0$     f     $2x - 9y - 6 = 0$

2    a     $x + 2y + 14 = 0$     b     $2x - y = 0$

  c     $2x - 3y + 12 = 0$     d     $6x + 5y + 10 = 0$