

## Solutions to Exercises Set 2

1. i c.

$$\begin{aligned}3x - 2y + 6 &= 0 \\3x + 6 &= 2y \\y &= \frac{3x + 6}{2} \\&= \frac{3}{2}x + 3\end{aligned}$$

f.

$$\begin{aligned}y + 1 &= 3(2x - 1) \\y &= 3(2x - 1) - 1 \\&= 6x - 3 - 1 \\&= 6x - 4\end{aligned}$$

2. i a. The general equation of the line is  $y = mx + b$  where  $m$  is the gradient of the line. Therefore the equation must be of the form  $y = 2x + b$ .

Since the line passes through the point  $(4, 1)$ , when  $x = 4$ ,  $y = 1$  so we have  $1 = 2(4) + b$ , and hence  $b = -7$ .

The equation of the line has the form  $y = 2x - 7$ .

b. The equation of the line has the form  $y = \frac{1}{3}x + b$ .

When  $x = 1$ ,  $y = -3$  so we have  $-3 = \frac{1}{3}(1) + b$ , and hence  $b = -\frac{10}{3}$ .

The equation of the line is  $y = \frac{1}{3}x - \frac{10}{3}$  or  $3y = x - 10$ .

c. The equation of the line must have the form  $y = -3x + b$ .

When  $x = 2$ ,  $y = 1$  so we have  $1 = -3(2) + b$ , and hence  $b = 7$ .

The equation of the line is  $y = -3x + 7$ .

d. The equation of the line has the form  $y = -1x + b$ .

When  $x = p$ ,  $y = q$  so  $q = -1(p) + b$ , and hence  $b = p + q$ .

The equation of the line is  $y = -x + p + q$ .

ii a. When  $x = 0$ ,  $y = 2(0) - 7 = -7$  so the  $y$ -intercept is  $-7$ .

When  $y = 0$ ,  $0 = 2x - 7$  ie  $x = \frac{7}{2}$  so the  $x$ -intercept is  $\frac{7}{2}$ .

3. i a. The gradient of the line given by

$$m = \frac{\text{change in } y}{\text{change in } x}.$$