Solutions

Marking: **M1** a correct method, **A1** the correct answer.

Each answer shows the steps, then the **result**.

2.1

- parallel lines share a gradient

$$= \mathbf{5}$$

2.2

- the gradient is still 3, so $y = 3x + c$
- substitute $(2, 9)$: $9 = 6 + c$, so $c = 3$

$$\mathbf{y = 3x + 3}$$

2.3

- divide the second equation by 4: $y = 2x - \frac{3}{4}$
- both gradients are 2, and the intercepts differ, so the lines are parallel

2.4

- parallel lines have the same gradient, 2; $2y = 4x + 1$ is $y = 2x + 0.5$: $\boldsymbol{y = 2x - 3}$ and $\boldsymbol{2y = 4x + 1}$

2.5

- $5y = -2x + 10$, so $y = -\frac{2}{5}x + 2$
- gradient $= -\mathbf{\frac{2}{5}}$

3.1

(a)

- divide by 3: $y = 4x - 3$

$$m = \mathbf{4}$$

(b)

- the parallel line is $y = 4x + c$
- substitute $(-1, 2)$: $2 = -4 + c$, so $c = 6$

$$\mathbf{y = 4x + 6}$$

3.2

- the gradient stays $-\frac{1}{2}$, so $y = -\frac{1}{2}x + c$
- substitute $(6, 5)$: $5 = -3 + c$, so $c = 8$

$$\mathbf{y = -\tfrac{1}{2}x + 8}$$

3.3

- $2y = 6x - 1$ is $y = 3x - 0.5$, gradient 3; so $k + 1 = 3$

$$k = \mathbf{2}$$

3.4

- gradient $= \dfrac{7 - 3}{2 - 0} = 2$
- $y = 2x + c$ through $(4, -1)$: $-1 = 8 + c$, so $c = -9$

$$\boldsymbol{y = 2x - 9}$$

3.5

(a)

- $\overrightarrow{BC}$ is 2 right and 4 up, and $\overrightarrow{AD} = \overrightarrow{BC}$
- D is $(0 + 2,\ 0 + 4) = (\mathbf{2},\ \mathbf{4})$

(b)

- gradient of $AD = \dfrac{4 - 0}{2 - 0} = 2$, the same as BC
- it passes through the origin: $\boldsymbol{y = 2x}$