Solutions

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

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

2.1

- the negative reciprocal of 4

$$= \mathbf{-\frac{1}{4}}$$

2.2

- the negative reciprocal of $-\frac{2}{3}$: turn it over and change the sign

$$= \mathbf{\frac{3}{2}}$$

2.3

- perpendicular gradient $= -\frac{1}{2}$
- substitute $(4, 3)$: $3 = -\frac{1}{2}(4) + c = -2 + c$, so $c = 5$

$$\mathbf{y = -\frac{1}{2}x + 5}$$

3.1

(a)

- $\dfrac{10-2}{5-1} = \dfrac{8}{4}$

$$= \mathbf{2}$$

(b)

- the midpoint of AB is $\left(\dfrac{1+5}{2},\ \dfrac{2+10}{2}\right) = (3,\ 6)$
- the perpendicular gradient is $-\frac{1}{2}$
- substitute $(3, 6)$: $6 = -\frac{3}{2} + c$, so $c = 7.5$

$$\mathbf{y = -\frac{1}{2}x + 7.5}$$

3.2

- rearrange the second: $3y = -x + 9$, so $y = -\frac{1}{3}x + 3$
- the gradients are 3 and $-\frac{1}{3}$

$$3 \times \left(-\tfrac{1}{3}\right) = -1, \text{ so the lines are } \textbf{perpendicular}$$