Solutions

2.1

- gradient **4**; y-intercept $\mathbf{-7}$, the point $(0, -7)$

2.2

- $m = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{8-2}{4-1} = \dfrac{6}{3} = \mathbf{2}$

2.3

- divide every term by 2: $y = 3x + 5$
- gradient **3**

2.4

- same gradient 2: $\boldsymbol{y = 2x + 1}$ and $\boldsymbol{y = 2x - 5}$

2.5

(a) $x = 0$: $y = -6$, so $(\mathbf{0}, \mathbf{-6})$

(b) $y = 0$: $3x - 6 = 0$, so $x = 2$: $(\mathbf{2}, \mathbf{0})$

3.1

- $m = \dfrac{0-6}{3-0} = -2$
- **No**: the line slopes **down**, so the gradient is -2, not 2

3.2

- parallel, so gradient 5: $y = 5x + c$, and $9 = 5 \times 1 + c$
- $c = 4$: $\boldsymbol{y = 5x + 4}$

3.3

- $m = \dfrac{-5-7}{4-(-2)} = \dfrac{-12}{6} = -2$
- substitute $(-2, 7)$: $7 = -2 \times (-2) + c$, so $c = 3$
- $\boldsymbol{y = -2x + 3}$

3.4

- perpendicular gradient: $m_1 m_2 = -1$, so $m_2 = -\frac{1}{2}$
- substitute $(4, 1)$: $1 = -\frac{1}{2} \times 4 + c$, so $c = 3$
- $\boldsymbol{y = -\frac{1}{2}x + 3}$

3.5

- midpoint: $\left(\dfrac{1+7}{2}, \dfrac{3+5}{2}\right) = (4, 4)$
- gradient of AB: $\dfrac{5-3}{7-1} = \dfrac{1}{3}$, so the perpendicular gradient is -3
- substitute $(4, 4)$: $4 = -3 \times 4 + c$, so $c = 16$
- $\boldsymbol{y = -3x + 16}$