

Solutions

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

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

2.1

- $y = 3^2 - 4 = \mathbf{5}$

2.2

- y -intercept at $x = 0$: $\mathbf{y = -5}$

2.3

- $x^2 - 9 = 0$ so $(x + 3)(x - 3) = 0$
- $\mathbf{x = 3}$ or $\mathbf{x = -3}$

2.4

- $x = -\frac{-6}{2} = 3$
- $y = 9 - 18 + 5 = -4$
- turning point $(\mathbf{3}, -\mathbf{4})$

2.5

- $x^2 + x - 4 = 0$ means $x^2 + x = 4$, so draw $\mathbf{y = 4}$

3.1

(a)

- $y = (-2)^2 - 2(-2) - 3 = 4 + 4 - 3 = \mathbf{5}$

(b)

- $(x - 3)(x + 1) = 0$
- $\mathbf{x = 3}$ or $\mathbf{x = -1}$

3.2

- $x^2 - 2x - 3 = 5$ so $x^2 - 2x - 8 = 0$
- $(x - 4)(x + 2) = 0$
- $\mathbf{x = 4}$ or $\mathbf{x = -2}$

3.3

(a)

- y values: $\mathbf{6, 1, -2, -3, -2, 1, 6}$

(b)

- $x = -\frac{-4}{2} = 2$

- $y = 4 - 8 + 1 = -3$
- turning point $(\mathbf{2}, -\mathbf{3})$

(c)

- the curve crosses the x -axis at about $\mathbf{x = 0.3}$ and $\mathbf{x = 3.7}$

(d)

- $x^2 - 4x - 2 = 0$ becomes $x^2 - 4x + 1 = 3$
- draw the line $\mathbf{y = 3}$ and read where it meets the curve

(e)

$$x = \frac{4 \pm \sqrt{16 + 8}}{2}$$

- $\sqrt{24} = 4.899$
- $\mathbf{x = 4.45}$ or $\mathbf{x = -0.45}$