Solutions

Marking: **M1** a correct method, **A1** the correct answer, **B1** an independent mark.

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

2.1

- $(x+4)^2 - 16 + 3$
- $\mathbf{(x+4)^2 - 13}$

2.2

- $(x-7)(x+2)$; critical values -2, 7
- between the roots: $\mathbf{-2 < x < 7}$

2.3

- $k^2 - 36 = 0$
- $\mathbf{k = \pm 6}$

2.4

- let $u = \sqrt{x}$: $u^2 - 5u + 6 = 0$
- $u = 2$ or $u = 3$
- $\mathbf{x = 4}$ or $\mathbf{x = 9}$

3.1

(a)

- $3(x^2 + 4x) + 7$
- $3\big((x+2)^2 - 4\big) + 7$
- $\mathbf{3(x+2)^2 - 5}$

(b) $(\mathbf{-2}, \mathbf{-5})$

3.2

- $x^2 - 3x + 2 = kx - 2 \Rightarrow x^2 - (3+k)x + 4 = 0$
- $(3+k)^2 - 16 > 0$
- critical values $k = 1$, $k = -7$
- $\mathbf{k < -7}$ or $\mathbf{k > 1}$

3.3

(a)

- $2(x^2 - 4x) + 11 = 2\big((x-2)^2 - 4\big) + 11$
- $\mathbf{2(x-2)^2 + 3}$

(b) $(\mathbf{2}, \mathbf{3})$

(c)

- $2x^2 - 8x + 11 = 2x + c \Rightarrow 2x^2 - 10x + (11 - c) = 0$
- $100 - 8(11 - c) = 0$
- $\mathbf{c = -\frac{3}{2}}$

(d)

- $x = \dfrac{10}{4} = 2.5$
- $y = 2(2.5) - 1.5$: $(\mathbf{2.5}, \mathbf{3.5})$