

Solutions

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

2.1

- $(x + 4)^2 - 13$

2.2

- $b^2 - 4ac < 0$

3.1 C

- Repeated root needs $b^2 - 4ac = 0$: $16 - 8c = 0 \Rightarrow c = 2$

3.2

- $3(x^2 + 4x) + 7 = 3((x + 2)^2 - 4) + 7 = 3(x + 2)^2 - 5$; least value = -5 (when $x = -2$)

3.3

- set equal: $x^2 - 3x + 2 = kx - 2 \Rightarrow x^2 - (3 + k)x + 4 = 0$; two points need $b^2 - 4ac > 0$:
 $(3 + k)^2 - 16 > 0$; $(k + 7)(k - 1) > 0$; $k < -7$ or $k > 1$

3.4

- substitute: $x^2 + (2x - 1)^2 = 2 \Rightarrow 5x^2 - 4x - 1 = 0$; $(5x + 1)(x - 1) = 0 \Rightarrow x = -\frac{1}{5}$ or $x = 1$; $y = 2x - 1$ gives $(1, 1)$ and $(-\frac{1}{5}, -\frac{7}{5})$