

Solutions

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

2.1

- $m = \frac{7 - (-1)}{6 - 2} = \frac{8}{4} = 2$

2.2

- centre $(3, -2)$; radius 5

3.1 C

- Perpendicular gradient $= -1 \div \frac{1}{3} = -3$

3.2

(a)

- complete the square: $(x + 3)^2 - 9 + (y - 5)^2 - 25 + 9 = 0 \Rightarrow (x + 3)^2 + (y - 5)^2 = 25$; centre $(-3, 5)$, radius 5

(b)

- put $y = 5$: $(x + 3)^2 + 0 = 25$, so $x + 3 = \pm 5$; $x = 2$ or $x = -8$, giving $(2, 5)$ and $(-8, 5)$; $y = 5$ passes through the centre, so the chord is a **diameter** — and its length, 10, is indeed $2r$.

3.3

(a)

- midpoint $(3, 6)$; gradient $AB = \frac{10 - 2}{5 - 1} = 2$, so bisector gradient $= -\frac{1}{2}$; $y - 6 = -\frac{1}{2}(x - 3) \Rightarrow y = -\frac{1}{2}x + \frac{15}{2}$

(b)

- set $y = 0$: $0 = -\frac{1}{2}x + \frac{15}{2} \Rightarrow x = 15$, so $C(15, 0)$