Solutions

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

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

2.1

- $C = 2\pi r = 2\pi \times 5 = \mathbf{10}\pi$ cm

2.2

- $A = \pi r^2$
- $\pi \times 6^2 = \mathbf{36}\pi$ cm$^\mathbf{2}$

2.3

$$\frac{90}{360} \times 2\pi \times 12 = \frac{1}{4} \times 24\pi = \mathbf{6}\pi \text{ cm}$$

2.4

- $C = \pi d = \pi \times 14 = 43.98\ldots = \mathbf{44.0}$ cm

2.5

- the curved part is half the circumference: $\frac{1}{2} \times 2\pi \times 4 = 4\pi$; add the diameter, 8 cm

$$\text{perimeter} = \mathbf{4}\pi + \mathbf{8} \text{ cm}$$

3.1

(a)

$$\frac{120}{360} \times \pi \times 9^2 = \frac{1}{3} \times 81\pi = \mathbf{27}\pi \text{ cm}^\mathbf{2}$$

(b)

- $\text{arc} = \frac{1}{3} \times 2\pi \times 9 = 6\pi$
- perimeter = arc $+2r = \mathbf{6}\pi + \mathbf{18}$ cm

3.2

- $\pi r^2 = 36\pi$ so $r^2 = 36$
- $\mathbf{r = 6}$ cm

3.3

- $2\pi r = 20\pi$, so $r = 10$
- area $= \pi r^2 = \pi \times 10^2 = \mathbf{100}\pi$ cm^2

3.4

- big circle minus small circle: $\pi \times 5^2 - \pi \times 3^2 = 25\pi - 9\pi$

$$= \mathbf{16}\pi \text{ cm}^2$$

3.5

(a)

- arc length $= \frac{\theta}{360} \times 2\pi r$: $\frac{\theta}{360} \times 12\pi = 4\pi$
- $\frac{\theta}{360} = \frac{1}{3}$, so $\theta = \mathbf{120}°$

(b)

- area $= \frac{\theta}{360} \times \pi r^2 = \frac{1}{3} \times 36\pi$

$$= \mathbf{12}\pi \text{ cm}^2$$

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