

**Self-assessment answers: 11 Geometry of triangles and circles**

1. (a)  $96 = \frac{1}{2}r^2 \times 0.7$

$$\Rightarrow r = \sqrt{\frac{2 \times 96}{0.7}} = 16.6 \text{ cm (3SF)}$$

(b) Perimeter  $= 2r + 0.7r = 44.7 \text{ cm (3SF)}$

[7 marks]

2. (a) By cosine rule,  $AC = \sqrt{BC^2 + AB^2 - 2AB \times BC \times \cos \hat{B}}$

$$= 14.9 \text{ cm}$$

$$\Rightarrow \text{Perimeter} = 30.9 \text{ cm (3SF)}$$

(b) By sine rule,  $\hat{A} = \arcsin\left(\frac{BC \sin \hat{B}}{AC}\right) = 24.9^\circ \text{ (3SF)}.$

(This is not a case of ambiguity, since  $\hat{B}$  is already known to be obtuse.)

[9 marks]

3. (a) Segment perimeter  $= 8\theta + 16\sin\frac{\theta}{2} = 9.5$

$$\Rightarrow \theta = 0.598 \text{ (3SF)}$$

(b) Shaded region  $= 2 \times \text{segment area}$

$$= r^2 (\theta - \sin \theta)$$

$$= 2.24 \text{ cm}^2 \text{ (3SF)}$$

[14 marks]