angles, circles, arcs & sectors- 1

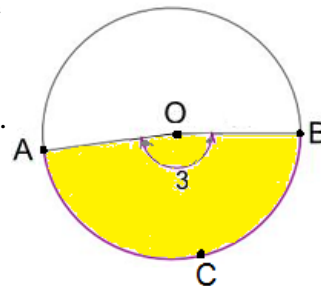**answers** on next page

**4 questions –** progressing from 'accessible' to 'discriminating'

1. A circle of radius 8 cm has a sector whose central angle
has radian measure of 3. Find the following **exactly**:
(a) the length of the arc from A to B passing through C.
(b) the area of the shaded sector.
[*no calculator*]

2. O is the centre of a circle with radius 24 cm.
Chord $[GH]$ is 36 cm. Find the area of the
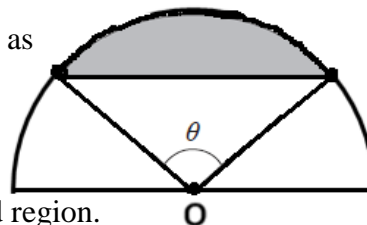shaded region.   [*calculator allowed*]
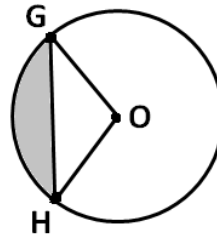
3. The semi-circle with centre O shown at right has an area of exactly 24 cm^2.
(a) Show that the shaded area can be expressed as

$$\frac{24\theta}{\pi} - \frac{24}{\pi}\sin\theta$$

(b) If $\theta = \frac{2\pi}{3}$, find the exact area of the shaded region.
[*no calculator*]

4. Two circles with the same radius *r* intersect as shown.
The angle subtended by the common chord (dashed
In diagram) at the centre of each circle is 2θ.
(a) Find an expression in terms of *r* and θ for the
shaded area.
(b) If the shaded area is equal to $\frac{1}{4}$ of the area of one
of the two circles show that $8\theta - 4\sin 2\theta = \pi$. Hence,
find θ accurate to three significant figures.
[*calculator allowed*]
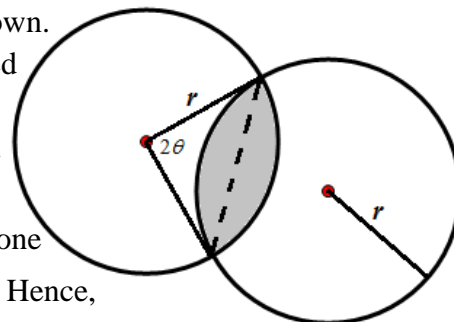
angles, circles, arcs & sectors- 1

Answers

1. (a) 24 cm   (b) 96 cm^2

2. approximately 203 cm^2

3. $16 - \dfrac{12\sqrt{3}}{\pi}$ cm^2

4. (a) $2\theta r^2 - r^2 \sin 2\theta$ (b) $\theta \approx 0.883$