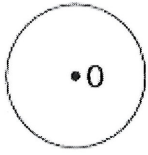


Circles Topic Test

Name: _____

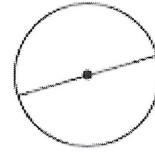
1. Name the parts of a circle shown below.



centre



radius



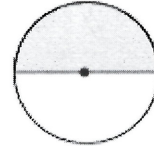
diameter



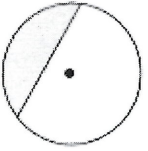
arc



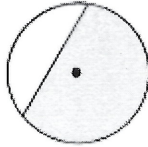
chord



semi-circle



minor segment



major segment



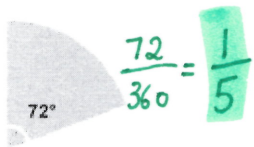
sector



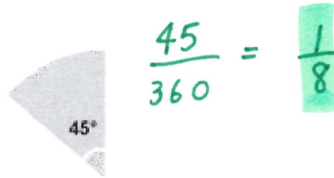
tangent

2. What fraction of each circle is shown below:

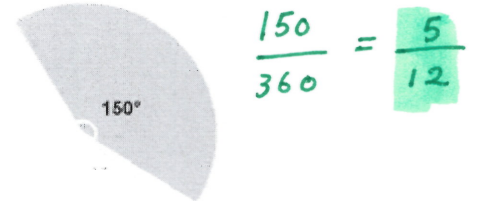
a)



b)

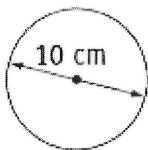


c)



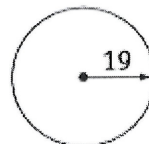
3. Find the circumference of each circle below.

a) In exact form



$$\begin{aligned} C &= 2\pi r \\ &= 2 \times \pi \times 5 \\ &= 10\pi \text{ cm (exact form)} \end{aligned}$$

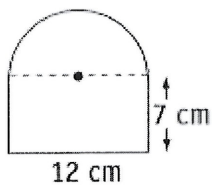
b) to 2 decimal places



$$\begin{aligned} C &= 2\pi r \\ &= 2 \times \pi \times 19 \\ &= 119.4 \text{ units} \end{aligned}$$

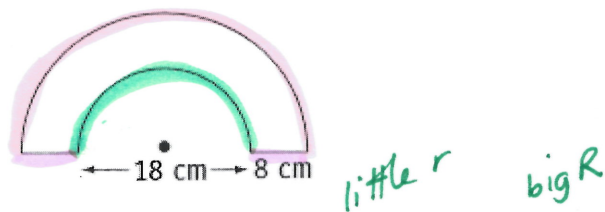
4. Calculate the perimeter of each shape below:

a) to 1 decimal place



$$\begin{aligned}
 P &= 12 + 7 + 7 + \frac{1}{2} \times 2\pi r \\
 &= 26 + \frac{1}{2} \times 2 \times \pi \times 6 \\
 &= 26 + 6\pi \\
 &= 44.8 \text{ cm}
 \end{aligned}$$

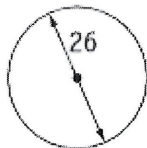
b) in exact form



$$\begin{aligned}
 P &= 8 + 8 + \frac{1}{2} \times 2\pi r + \frac{1}{2} \times 2\pi R \\
 &= 16 + \frac{1}{2} \times 2 \times \pi \times 9 + \frac{1}{2} \times 2 \times \pi \times 17 \\
 &= 16 + 9\pi + 17\pi \\
 &= (16 + 26\pi) \text{ cm (exact form)}
 \end{aligned}$$

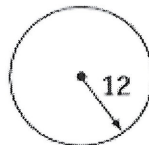
5. Find the area of the circles below:

a) In exact form



$$\begin{aligned}
 A &= \pi r^2 \\
 &= \pi \times 13^2 \\
 &= 169\pi \text{ units}^2
 \end{aligned}$$

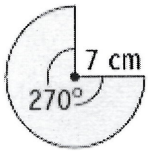
b) to 3 decimal places



$$\begin{aligned}
 A &= \pi \times r^2 \\
 &= \pi \times 12^2 \\
 &= 452.389 \text{ units}^3
 \end{aligned}$$

6. Find the perimeter and area of the sector below:

a) Perimeter



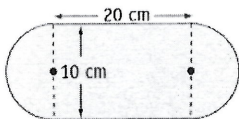
$$\begin{aligned}
 P &= 7 + 7 + \frac{3}{4} \times 2\pi r \\
 &= 14 + \frac{3}{4} \times 2 \times \pi \times 7 \\
 &= (14 + 10.5\pi) \text{ cm} \\
 &= 46.99 \text{ cm (2dp)}
 \end{aligned}$$

b) Area

$$\begin{aligned}
 A &= \frac{3}{4} \times \pi r^2 \\
 &= \frac{3}{4} \times \pi \times 7^2 \\
 &= 115.45 \text{ cm}^2 \text{ (2dp)}
 \end{aligned}$$

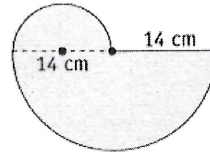
7. Find the shaded area:

a)



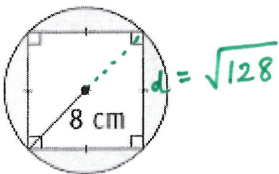
$$\begin{aligned}
 A &= \pi r^2 + 20 \times 10 \\
 &= \pi \times 5^2 + 200 \\
 &= (25\pi + 200) \text{ cm}^2 \\
 &= 278.5 \text{ cm}^2 \text{ (1dp)}
 \end{aligned}$$

b)



$$\begin{aligned}
 A &= \frac{1}{2} \times \pi r^2 + \frac{1}{2} \times \pi R^2 \\
 &= \frac{1}{2} \times \pi \times 7^2 + \frac{1}{2} \times \pi \times 14^2 \\
 &= 384.8 \text{ cm}^2 \text{ (1dp)}
 \end{aligned}$$

c)



Pythagoras' Theorem

$$d^2 + d^2 = 16^2$$

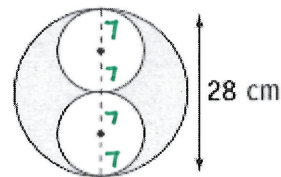
$$2d^2 = 256$$

$$d^2 = 128$$

$$d = \sqrt{128}$$

$$\begin{aligned}
 \text{Area} &= \pi r^2 - \frac{1}{2} \times \sqrt{128} \times \sqrt{128} \\
 &= \pi \times 8^2 - \frac{128}{2} \\
 &= 64\pi - 64 \\
 &= 137.1 \text{ cm}^2
 \end{aligned}$$

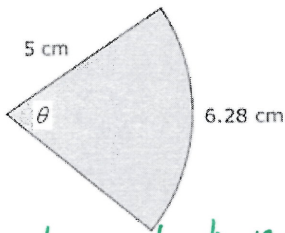
d)



$$\begin{aligned}
 \text{Area} &= \pi \times R^2 - 2 \times \pi r^2 \\
 &= \pi \times 14^2 - 2 \times \pi \times 7^2 \\
 &= 196\pi - 98\pi \\
 &= 98\pi \text{ cm}^2 \\
 &= 307.9 \text{ cm}^2 \text{ (1dp)}
 \end{aligned}$$

8.

a) Find the size of θ .



Working backwards

$$\frac{\theta}{360} \times 2\pi r = 6.28$$

$$360 \times \frac{\theta}{360} \times 2 \times \pi \times 5 = 6.28 \times 360$$

$$\frac{\theta \times 2 \times \pi \times 5}{2 \times \pi \times 5} = \frac{2260.8}{2 \times \pi \times 5}$$

$$\theta = \frac{2260.8}{2 \times \pi \times 5}$$

$$\theta = 71.96^\circ \text{ (2 dp)}$$

b) Find the area of the sector.

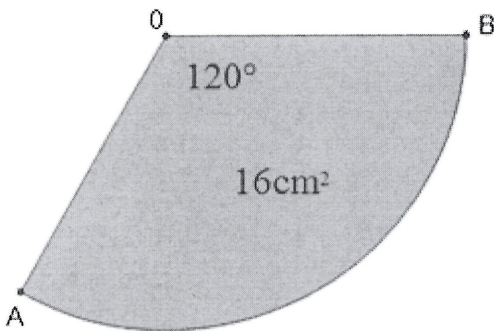
A

$$= \frac{\theta}{360} \times \pi \times r^2$$

$$= \frac{71.96}{360} \times \pi \times 5^2$$

$$= 15.7 \text{ cm}^2$$

9. Find the radius if the area of the sector is 16 cm^2 .



$$A = \frac{120}{360} \times \pi r^2$$

$$3 \times 16 = \frac{1}{3} \times \pi \times r^2 \times 3$$

$$\frac{48}{\pi} = \frac{\pi r^2}{\pi}$$

$$r^2 = \frac{48}{\pi}$$

$$r = \sqrt{\frac{48}{\pi}} \quad \text{as } r > 0$$

$$r = 3.9 \text{ cm (1 dp)}$$