1 Convert to radians, in terms of π:

a $90°$ **b** $60°$ **c** $30°$ **d** $18°$ **e** $9°$

f $135°$ **g** $225°$ **h** $270°$ **i** $360°$ **j** $720°$

2. Convert the following radian measures to degrees:

a $\frac{\pi}{5}$ **b** $\frac{3\pi}{5}$ **c** $\frac{3\pi}{4}$ **d** $\frac{\pi}{18}$ **e** $\frac{\pi}{9}$

f $\frac{7\pi}{9}$ **g** $\frac{\pi}{10}$ **h** $\frac{3\pi}{20}$ **i** $\frac{7\pi}{6}$ **j** $\frac{\pi}{8}$

Answers

1 **a** $\frac{\pi}{2}^c$ **b** $\frac{\pi}{3}^c$ **c** $\frac{\pi}{6}^c$ **d** $\frac{\pi}{10}^c$ **e** $\frac{\pi}{20}^c$

f $\frac{3\pi}{4}^c$ **g** $\frac{5\pi}{4}^c$ **h** $\frac{3\pi}{2}^c$ **i** $2\pi^c$ **j** $4\pi^c$

2. **a** $36°$ **b** $108°$ **c** $135°$ **d** $10°$ **e** $20°$

f $140°$ **g** $18°$ **h** $27°$ **i** $210°$ **j** $22.5°$

---

1 Use radians to find the arc length and area of a sector of a circle of:

a radius 9 cm and angle $\frac{7\pi}{4}$ **b** radius 4.93 cm and angle 4.67 radians.

2 A sector has an angle of $107.9°$ and an arc length of 5.92 m. Find its:

a radius **b** area.

3 A sector has an angle of 1.19 radians and an area of 20.8 cm^2. Find its:

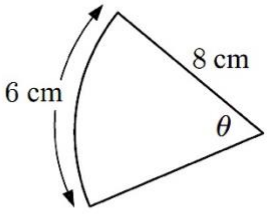
a radius **b** perimeter.

4 Find, in radians, the angle of a sector of:

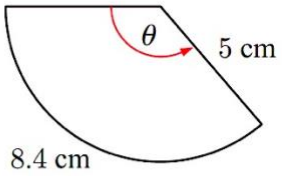
a radius 4.3 m and arc length 2.95 m **b** radius 10 cm and area 30 cm^2.

5 Find θ (in radians) for each of the following, and hence find the area of each figure:

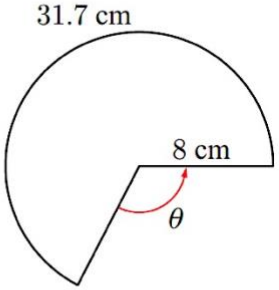
a



b

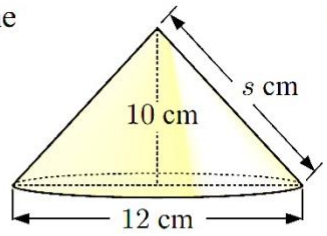


c

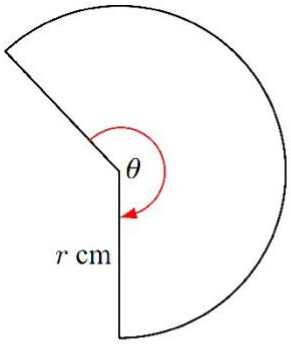


6 Find the arc length and area of a sector of radius 5 cm and angle 2 radians.

7 If a sector has radius $2x$ cm and arc length x cm, show that its area is x^2 cm^2.

8 The cone 

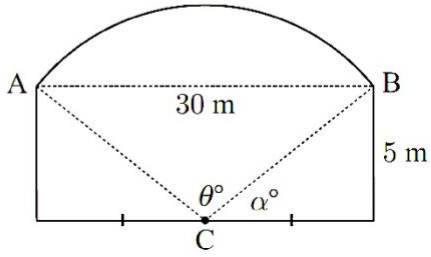
is made from this sector:



Find correct to 3 significant figures:

a the slant length s cm **b** the value of r

c the arc length of the sector **d** the sector angle θ in radians.

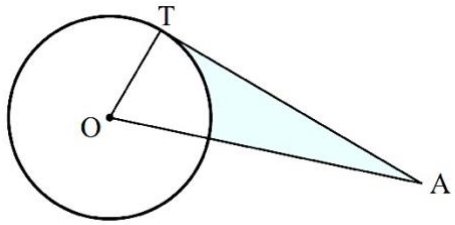
9 

The end wall of a building has the shape illustrated, where the centre of arc AB is at C. Find:

a α to 4 significant figures

b θ to 4 significant figures

c the area of the wall.

10 

[AT] is a tangent to the given circle. OA = 13 cm and the circle has radius 5 cm. Find the perimeter of the shaded region.

Answers

1 **a** 49.5 cm, 223 cm^2 **b** 23.0 cm, 56.8 cm^2

2 **a** 3.14 m **b** 9.30 m^2 **3** **a** 5.91 cm **b** 18.9 cm

4 **a** 0.686^c **b** 0.6^c

5 **a** 0.75^c, 24 cm^2 **b** 1.68^c, 21 cm^2 **c** 2.32^c, 126.8 cm^2

6 10 cm, 25 cm^2

8 **a** 11.7 cm **b** 11.7 **c** 37.7 cm **d** 3.23^c

9 **a** $\alpha \approx 18.43$ **b** $\theta \approx 143.1$ **c** 387 m^2

10 25.9 cm **11** **b** 2 h 24 min **12** 227 m^2

13 **a** $\alpha = 5.739$ **b** $\theta = 168.5$ **c** $\phi = 191.5$ **d** 71.62 cm