

Exercise 2.1

1. Express each of the following angles in radians, giving your answers in terms of π :

(i) 30°

$$\frac{\pi}{6}$$

(ii) 45°

$$\frac{\pi}{4}$$

(iii) 150°

$$\begin{aligned} 180 - 30 \\ \pi - \frac{\pi}{6} \\ \frac{5\pi}{6} \end{aligned}$$

(iv) 135°

$$\begin{aligned} 90 + 45 \\ \frac{\pi}{2} + \frac{\pi}{4} \\ \frac{3\pi}{4} \end{aligned}$$

(v) 36°

$$\begin{aligned} \frac{180}{5} \\ = \frac{\pi}{5} \end{aligned}$$

(vi) 240°

$$\begin{aligned} 180 + 60 \\ \pi + \frac{\pi}{3} \\ \frac{4\pi}{3} \end{aligned}$$

(vii) 390°

$$\begin{aligned} 360 + 30 \\ 2\pi + \frac{\pi}{6} \\ \frac{13\pi}{6} \end{aligned}$$

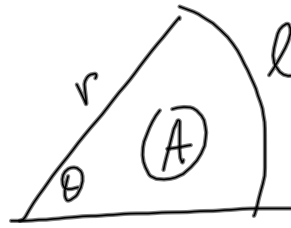
5. An arc of length 15 cm subtends an angle of 2 radians at the centre of a circle. Find the length of the radius.

$$l = r\theta$$

$$r = \frac{l}{\theta} = \frac{15}{2}$$

6. The radius of a circle is 5 cm.
Find the area of the sector if the length of the arc is 6 cm.

$$A = \frac{1}{2} r^2 \theta$$



$$r = 5$$

$$l = 6$$

$$\theta = ?$$

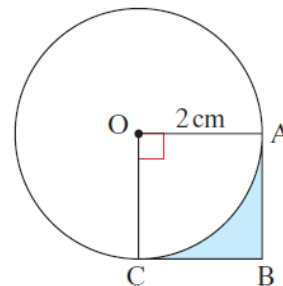
$$A = ?$$

$$l = r\theta$$

$$\Rightarrow \theta = \frac{l}{r} = \frac{6}{5}$$

$$A = \frac{1}{2} (5)^2 \left(\frac{6}{5}\right) = 15 \text{ cm}^2$$

12. In the given figure, OABC is a square and the radius of the circle is 2 cm.
Find the area of the shaded region in terms of π .



Shaded = Square
less sector

$$\text{Angle} = \frac{\pi}{2}$$

$$\text{Area Square} = l^2 = 2^2 = 4 \text{ cm}^2$$

$$\text{Area Sector } A = \frac{1}{2} r^2 \theta$$

$$= \frac{1}{2} (2)^2 \left(\frac{\pi}{2}\right) = \pi$$

$$\text{Shaded} = (4 - \pi) \text{ cm}^2$$