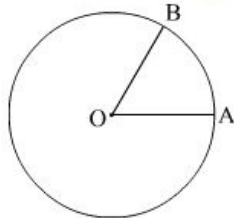




Areas Related to Circles Ex 15.2 Q20

Answer :

It is given that the radius of circle is r cm and angle $\angle AOB = \theta^\circ$.



(i) We know that the arc length l of a sector of an angle θ in a circle of radius r is

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

Perimeter of sector $AOB = OB + OA + \text{arc length } AB$

Now we substitute the value of OB , OA and l to find the perimeter of sector AOB ,

$$\text{Perimeter of sector } AOB = r + r + \frac{\theta}{360^\circ} \times 2\pi r$$

$$50 = 2r \left(1 + \frac{\pi\theta}{360^\circ} \right)$$

$$\frac{25}{r} = 1 + \frac{\pi\theta}{360^\circ}$$

$$\frac{\pi\theta}{360^\circ} = \frac{25}{r} - 1$$

$$\theta = \frac{360^\circ}{\pi} \left(\frac{25}{r} - 1 \right)$$

(ii) We know that area A of the sector at an angle θ in the circle of radius r is

$$A = \frac{\theta}{360^\circ} \times \pi r^2. \text{ Thus}$$

$$\text{Area of sector } AOB = \frac{\theta}{360^\circ} \pi r^2$$

Substituting the value of θ ,

$$A = \frac{\frac{360^\circ}{\pi} \left(\frac{25}{r} - 1 \right)}{360^\circ} \pi r^2$$

$$A = \left(\frac{25}{r} - 1 \right) r^2$$

$$A = 25r - r^2$$

Areas Related to Circles Ex 15.2 Q21

Answer :

Angle made by the minute hand in 1 minute = 6°

Angle made by the minute hand in 5 minutes = $5 \times 6^\circ = 30^\circ$

Area of the sector having central angle is given by

$$\frac{30^\circ}{360^\circ} \pi (14)^2$$

$$= \frac{1}{12} \times \frac{22}{7} (14)^2$$

$$= 51.33 \text{ cm}^2$$

Hence, the area swept by minute hand in 5 minutes is 51.33 cm^2

Areas Related to Circles Ex 15.2 Q22

Answer :

Here, we have $\theta = 60^\circ$ and $r = 21$ cm

(i) The length of the arc is given by

$$\begin{aligned} & \frac{60^\circ}{360^\circ} \times 2\pi(21) \\ &= \frac{1}{6} \times 2 \times \frac{22}{7} \times 21 \\ &= 22 \text{ cm} \end{aligned}$$

(ii) Area of the sector formed by the arc is given by

$$\begin{aligned} & \frac{60^\circ}{360^\circ} \pi(21)^2 \\ &= \frac{1}{6} \times \frac{22}{7} (21)^2 \\ &= 231 \text{ cm}^2 \end{aligned}$$

***** END *****