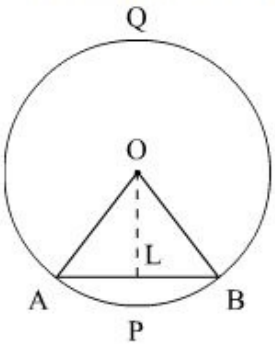
Areas Related to Circles Ex 15.2 Q10

Answer :

We have to find the area of the sector AOB formed by the chord AB.



We have $OA = 4$ cm and $AB = 4$ cm. So,

$$AL = \frac{AB}{2} \text{ cm}$$
$$= \frac{4}{2} \text{ cm}$$
$$= 2 \text{ cm}$$

Let $\angle AOB = 2\theta$. Then,

$$\angle AOL = \angle BOL$$
$$= \theta$$

In ΔOLA, we have

$$\sin\theta = \frac{AL}{OA}$$
$$= \frac{2}{4}$$
$$= \frac{1}{2}$$
$$\theta = \sin^{-1}\frac{1}{2}$$
$$= 30°$$

Hence, $\angle AOB = 60°$

Now, using the value of $\angle AOB$ and r we will find the area of sector AOB,

$$A = \frac{\theta}{360°} \times \pi r^2$$
$$= \frac{60°}{360°} \times \pi \times 4 \times 4 \text{ cm}^2$$
$$= \boxed{\frac{8\pi}{3} \text{ cm}^2}$$

Areas Related to Circles Ex 15.2 Q11

Answer :

We know that the arc length l and area A of a sector of an angle θ in the circle of radius r is given by

$l = \frac{\theta}{360^\circ} \times 2\pi r$ and $A = \frac{\theta}{360^\circ} \times \pi r^2$ respectively.

It is given that, $r = 35$ cm and $\theta = 72^\circ$.

We will calculate the arc length using the value of r and θ,

$$l = \frac{72^\circ}{360^\circ} \times 2\pi \times 35 \text{ cm}$$
$$= \frac{72^\circ}{360^\circ} \times 2 \times \frac{22}{7} \times 35 \text{ cm}$$
$$= \boxed{44 \text{ cm}}$$

Now, we will find the value of area A of the sector

$$A = \frac{72^\circ}{360^\circ} \times \pi \times 35 \times 35 \text{ cm}^2$$
$$= \boxed{770 \text{ cm}^2}$$

Areas Related to Circles Ex 15.2 Q12

Answer :

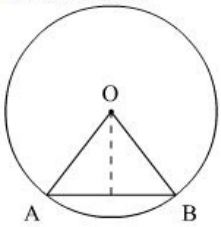
We know that the area A of a sector of circle of radius r and arc length l is given by

$$A = \frac{1}{2} lr$$

Let OAB is the given sector. Then,

$$\text{Perimeter of sector } OAB = 27.2 \text{ cm}$$
$$OA + OB + arc\ AB = 27.2 \text{ cm}$$
$$5.7 + 5.7 + arc\ AB = 27.2 \text{ cm}$$
$$11.4 + arc\ AB = 27.2 \text{ cm}$$
$$arc\ AB = 15.8 \text{ cm}$$

So, $l = 15.8$ cm



Now substituting the value of r and l in above formula,

$$A = \frac{1}{2} \times 15.8 \times 5.7$$
$$= \boxed{45.03 \text{ cm}^2}$$

********** END **********