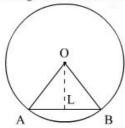


## Areas Related to Circles Ex 15.3 Q1 Answer:

We know that the area of minor segment of angle  $\theta$  in a circle of radius r is,

$$A = \left\{ \frac{\pi \theta}{360^{\circ}} - \sin \frac{\theta}{2} \cos \frac{\theta}{2} \right\} r^2$$

It is given that the chord AB divides the circle in two segments.



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

$$AL = \frac{AB}{2} \text{ cm}$$
$$= \frac{4}{2} \text{ cm}$$
$$= \frac{3}{2} \text{ cm}$$

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

$$\angle AOL = \angle BOL$$

$$=\theta$$

 $\ln \Delta OLA$ , we have

$$\sin \theta = \frac{AL}{OA}$$

$$= \frac{2}{4}$$

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

$$\theta = \sin^{-1} \frac{1}{2}$$

$$= 30^{\circ}$$

Hence,  $\angle AOB = 60^{\circ}$ 

Now using the value of r and  $\theta$ , we will find the area of minor segment

$$A = \left\{ \frac{\pi \times 60^{\circ}}{360^{\circ}} - \sin\frac{60^{\circ}}{2}\cos\frac{60^{\circ}}{2} \right\} \times 4 \times 4$$
$$= \left\{ \frac{\pi}{6} - \sin 30^{\circ}\cos 30^{\circ} \right\} \times 16$$
$$= \left\{ \frac{16 \times \pi}{6} - \frac{1}{2} \times \frac{\sqrt{3}}{2} \times 16 \right\}$$
$$= \left\{ \frac{8\pi}{3} - 4\sqrt{3} \right\} \text{ cm}^2$$

Areas Related to Circles Ex 15.3 Q2

## Answer:

We know that the area of minor segment of angle  $\theta$  in a circle of radius r is,

$$A = \left\{ \frac{\pi \theta}{360^{\circ}} - \sin \frac{\theta}{2} \cos \frac{\theta}{2} \right\} r^2$$

It is given that the chord PQ divides the circle in two segments.



We have  $\angle POQ = 120^{\circ}$  and PQ = 12 cm. So,

$$PL = \frac{PQ}{2} \text{ cm}$$
$$= \frac{12}{2} \text{ cm}$$
$$= 6 \text{ cm}$$

Since  $\angle POQ = 120^{\circ}$ ,

$$\angle POL = \angle QOL$$
  
=  $60^{\circ}$   
Since  $\angle POQ = 120^{\circ}$ .

$$\angle POL = \angle QOL$$
  
=  $60^{\circ}$ 

 $\ln \Delta OPQ$  , we have

$$\sin\theta = \frac{PL}{OA}$$

$$\sin 60^\circ = \frac{6}{OA}$$

$$\frac{\sqrt{3}}{2} = \frac{6}{OA}$$

$$OA = \frac{12}{\sqrt{3}}$$

Thus the radius of circle is  $OA = 4\sqrt{3}$  cm

Now using the value of radius r and angle  $\theta$  we will find the area of minor segment

$$A = \left\{ \frac{120^{\circ}\pi}{360^{\circ}} - \sin\frac{120^{\circ}}{2}\cos\frac{120^{\circ}}{2} \right\} \left(4\sqrt{3}\right)^{2}$$
$$= \left\{ \frac{\pi}{3} - \frac{\sqrt{3}}{2} \times \frac{1}{2} \right\} \times 48$$
$$= \left[ 4\left\{ 4\pi - 3\sqrt{3} \right\} \text{ cm}^{2} \right]$$

\*\*\*\*\*\*\*\*\*\* END \*\*\*\*\*\*\*\*