



Measurement Of Angles Ex 4.1 Q16

We have,

In circular track,

$$OA = OB = r = 150 \text{ m}$$

$\angle AOB = \theta =$ angle the train turns in 10 seconds

Speed of train = 66 km/hr

$$\begin{aligned} &= \frac{66 \times 1000}{60 \times 60} \text{ m/sec} \\ &= \frac{110}{6} \text{ m/sec} \end{aligned}$$

$$\therefore \text{Train will travel in 10 sec} = \frac{110}{6} \times 10 = \frac{1100}{6} \text{ m}$$

$$\therefore \text{arc } AB = \frac{1100}{6} \text{ m}$$

Thus,

$$\theta = \frac{\text{arc}}{\text{radius}} = \frac{1100}{6 \times 1500} = \frac{11}{90} \text{ radian}$$

$$\therefore \text{The train will turn by } \left(\frac{11}{90}\right)^c \text{ angle in 10 sec.}$$

Measurement Of Angles Ex 4.1 Q17

Let, r be the distance, at which coin is placed. So that it completely conceals the full moon.

Let, E be the eye of the observer.

Now,

$$\begin{aligned} \theta = 31' &= \left(\frac{31}{60}\right)^0 & [\because 60' = 1^0] \\ &= \frac{31}{60} \times \left(\frac{\pi}{180}\right)^c & \left[\because 1^0 = \left(\frac{\pi}{180}\right)^c\right] \end{aligned}$$

Also,

$$\widehat{AB} = \text{arc } AB = 2 \text{ cm} = 0.02 \text{ m.}$$

Now,

$$\begin{aligned} \text{by } \theta &= \frac{\text{arc}}{\text{radius}} \\ \frac{31\pi}{60 \times 180} &= \frac{0.02}{r} \\ \Rightarrow r &= \frac{0.02 \times 60 \times 180}{31\pi} & \left[\because \pi = \frac{22}{7}\right] \\ &= 2.217 \text{ m} \end{aligned}$$

Thus,

The coin should be placed at a distance of 2.217 m from the eye.

Measurement Of Angles Ex 4.1 Q18

Let, E be the eye of the observer and S be the sun.

Now,

$$\begin{aligned}\angle AOB &= \theta = 32' \\ &= \left(\frac{32}{60}\right)^{\circ} \\ &= \left(\frac{32}{60} \times \frac{\pi}{180}\right)^{\circ}\end{aligned}$$

$$\begin{aligned}\therefore \theta &= \frac{\text{arc}}{\text{radius}} \\ \Rightarrow \frac{32}{60} \times \frac{\pi}{180} &= \frac{AB}{91 \times 10^6} \text{ km} \\ \Rightarrow AB &= \frac{91 \times 10^6 \times 32 \times \pi}{60 \times 180} \\ &= 8.474074 \times 10^5 \text{ km} \\ &= 847407.4 \text{ km}\end{aligned}$$

\therefore Distance of sun is 847407.4 km.

Measurement Of Angles Ex 4.1 Q19

Let, C_1 & C_2 are two circles with same Arc length l .
That is $AB = CD = l$

Let, θ_1 and θ_2 are two angles subtended by arc AB and CD on respective circles.

Let, $OA = OB = r$ [radius of C_1]
and $OC = OD = R$ [radius of C_2]

Also,

$$\begin{aligned}\theta_1 &= 65^{\circ} = \left(\frac{65\pi}{180}\right)^{\circ} \\ \text{and } \theta_2 &= 110^{\circ} = \left(\frac{110\pi}{180}\right)^{\circ}\end{aligned}$$

We know

$$\begin{aligned}\theta &= \frac{\text{arc}}{\text{radius}} \\ \therefore \text{For } C_1 \\ \theta_1 &= \frac{AB}{r} \\ \Rightarrow \theta_1 &= \frac{l}{r} \\ \Rightarrow r &= \frac{l}{\theta_1} \quad \text{---(i)}\end{aligned}$$

For C_2

$$\begin{aligned}\theta_2 &= \frac{CD}{R} \\ \Rightarrow \theta_2 &= \frac{l}{R} \\ \Rightarrow R &= \frac{l}{\theta_2} \quad \text{---(ii)}\end{aligned}$$

From (i) and (ii)

$$\frac{r}{R} = \frac{\frac{l}{\theta_1}}{\frac{l}{\theta_2}} = \frac{\theta_2}{\theta_1} = \frac{\frac{110\pi}{180}}{\frac{65\pi}{180}} = \frac{22}{13}$$

$\therefore r : R = 22 : 13$

Measurement Of Angles Ex 4.1 Q20

Let, $AB = \text{arc } AB = 22 \text{ cm}$
 $OA = OB = r = 100 \text{ cm}$

Let θ be the angle subtended by arc AB at centre O .

$$\therefore \text{ by } \theta = \frac{\text{arc}}{\text{radius}}$$

$$\Rightarrow \theta = \frac{22}{100} \text{ radian}$$

$$\therefore \theta = \left(\frac{22}{100} \times \frac{180}{\pi} \right)^0 \quad \left[\because 1 \text{ radian} = \left(\frac{180}{\pi} \right)^0 \right]$$

$$= 12.6^0$$

$$= 12^0 36^1$$

$$\left[\because 1^0 = 60^1 \right]$$

$$\therefore \theta = 12^0 36^1$$

***** END *****