Measurement Of Angles Ex 4.1 Q16

We have,

In circular track,

$OA = OB = r = 150$ m

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

Speed of train = 66 km/hr

$$= \frac{66 \times 1000}{60 \times 60} \text{ m/sec}$$

$$= \frac{110}{6} \text{ m/sec}$$

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

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

Thus,

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

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

Measurement Of Angles Ex 4.1 Q17

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

Let, E be the eye of the observer.

Now,

$$\theta = 31' = \left(\frac{31}{60}\right)^0 \qquad \left[\because 60' = 1^0\right]$$

$$= \frac{31}{60} \times \left(\frac{\pi}{180}\right)^c \qquad \left[\because 1^0 = \left(\frac{\pi}{180}\right)^c\right]$$

Also,

$\overset{\frown}{AB}$ = arc AB = 2 cm = 0.02 m.

Now,

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

$$\frac{31\pi}{60 \times 180} = \frac{0.02}{r}$$

$$\Rightarrow \quad r = \frac{0.02 \times 60 \times 180}{31\pi}$$

$$= 2.217 \text{ m} \qquad \left[\because \pi = \frac{22}{7}\right]$$

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 sum.

Now,

$$\angle AOB = \theta = 32'$$

$$= \left(\frac{32}{60}\right)^0$$

$$= \left(\frac{32}{60} \times \frac{\pi}{180}\right)^C$$

$$\because \quad \theta = \frac{\text{arc}}{\text{radius}}$$

$$\Rightarrow \quad \frac{32}{60} \times \frac{\pi}{180} = \frac{AB}{91 \times 10^6} \text{ km}$$

$$\Rightarrow \quad AB = \frac{91 \times 10^6 \times 32 \times \pi}{60 \times 180}$$

$$= 8.474074 \times 10^5 \text{ km}$$

$$= 847407.4 \text{ km}$$

$\therefore$ 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 adn θ_2 are two angles subtended by arc AB and CD on respective circles.

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

Also,

$$\theta_1 = 65^0 = \left(\frac{65\pi}{180}\right)^c$$

and $$\theta_2 = 110^0 = \left(\frac{110\pi}{180}\right)^c$$

We know

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

$\therefore$ For C_1

$$\theta_1 = \frac{AB}{r}$$

$$\Rightarrow \quad \theta_1 = \frac{l}{r}$$

$$\Rightarrow \quad r = \frac{l}{\theta_1} \qquad \text{---(i)}$$

For C_2

$$\theta_2 = \frac{CD}{R}$$

$$\Rightarrow \quad \theta_2 = \frac{l}{R}$$

$$\Rightarrow \quad R = \frac{l}{\theta_2} \qquad \text{---(i)}$$

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 = arc AB = 22 cm

$OA = OB = r = 100$ cm

Let θ bet the angle subtanded by arc AB at centre O.

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

$\Rightarrow$ $\theta = \dfrac{22}{100}$ radian

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

$= 12.6^0$

$= 12^0 36^1$ $\left[\because 1^0 = 60^1\right]$

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

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