DAY 3

1. **Find the area of the minor segment, if radius of the circle is 21 *cm* and the chord makes angle 120^0 at the centre.** **[Example 3]**

Sol:- Here $r = 21\ cm, \theta = 120^0$

Area of Minor segment $= \frac{\pi r^2\theta}{360^0} - \frac{1}{2}r^2 sin\theta$

$$= \frac{22}{7} \times 21 \times 21 \times \frac{120^0}{360^0} - \frac{1}{2} \times 21 \times 21 \times \sin 120^0$$

$$= 462 - \frac{1}{2} \times 21 \times 21 \times \cos 30^0 \qquad \{\text{As } \sin 120^0 = \cos 30^0\}$$

$$= 462 - \frac{441}{2} \times \frac{\sqrt{3}}{2} = \left(\mathbf{462 - \frac{441\sqrt{3}}{4}}\right) \boldsymbol{cm^2}$$

2. **Find the area of a quadrant of a circle whose circumference is 22 *cm*.** **[Ex 12.2. Q2]**

Sol:- Given Circumference of circle = 22

$$\Rightarrow \quad 2\pi r = 22 \qquad \Rightarrow \quad 2 \times \frac{22}{7} \times r = 22$$

$$\Rightarrow \quad r = \frac{22 \times 7}{22 \times 2} = \frac{7}{2} cm$$

Area of quadrant $= \frac{1}{4}\pi r^2 = \frac{1}{4} \times \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} = \boldsymbol{\frac{77}{8}\ cm^2}$

3. **A brooch is made with silver wire in the form of a circle with diameter 35*mm*. The wire is used in making 5 diameters which divide the circle into 10 equal sectors as shown in the figure. Find:**
   i) The total length of the silver wire required.
   ii) The area of each sector of the brooch

Sol:- Diameter of the circle = **35*mm*** $\Rightarrow$ **radius** $(r) = \frac{35}{2} mm$

i) According to question, the silver wire is used in making **circumference** and 5 **diameters**.

$\therefore$ **The total length of the silver wire** $= \left(\begin{matrix}\text{Circumference of} \\ \text{the circle}\end{matrix}\right) + 5(\text{diameters})$

$$= 2\pi r + 5 \times 35 = 2 \times \frac{22}{7} \times \frac{35}{2} + 175 = 110 + 175 = 285\ mm$$

ii) **Now** Given The brooch is divided into **10 equal sectors.**

$\therefore$ Area of each sector $= \boldsymbol{\frac{1}{10}}\pi r^2 = \frac{1}{10} \times \frac{22}{7} \times \frac{35}{2} \times \frac{35}{2} = \boldsymbol{\frac{385}{4}\ mm^2}$

4. **An umbrella has 8 ribs which are equally spaced. Assuming that umbrella to be flat circle of radius 45 *cm.* Find the area between the two consecutive ribs of the circle. [Ex 12.2, Q10]**

Sol:- radius $(r) = 45\ cm$

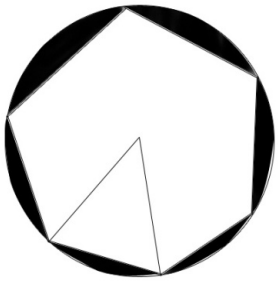
Given circular umbrella is divided into **8 equal parts.**

$\therefore$ Area of each sector $= \mathbf{\frac{1}{8}}\pi r^2 = \frac{1}{8} \times \frac{22}{7} \times 45 \times 45 = \mathbf{\frac{22275}{28}}\ \boldsymbol{cm^2}$

5. **A round table cover has six equal designs, If the radius of the cover is 28 *cm*. Find the cost of making the designs at the rate of ₹ 0.35 per cm^2. (Use $\sqrt{3} = 1.7$) [Ex 12.2, Q13]**

Sol:- radius $(r) = 28\ cm$

Given table cover divided into **six equal designs. So angle made at the centre is** $\frac{360^0}{60^0} = 60^0$ and each design is in the shape of minor segment.



Area of complete design $= 6\left(\frac{\pi r^2\theta}{360^0} - \frac{1}{2}r^2 sin\theta\right)$

$$= 6 \times \left(\frac{22}{7} \times 28 \times 28 \times \frac{60^0}{360^0} - \frac{1}{2} \times 28 \times 28 \times \sin 60^0\right)$$

$$= 6 \times \left(\frac{1232}{3} - 392 \times \frac{\sqrt{3}}{2}\right) = 6 \times \left(\frac{1232}{3} - 392 \times \frac{1.7}{2}\right)$$

$$= 6 \times (410.67 - 333.2) = 6 \times 7.47 = \mathbf{464.82}\ \boldsymbol{cm^2}$$

Now cost of making the design$= 464.82 \times 0.35 = 162.69$ ₹

EXERCISE

1. **Ex 12.2, Q 8,11,12,14**