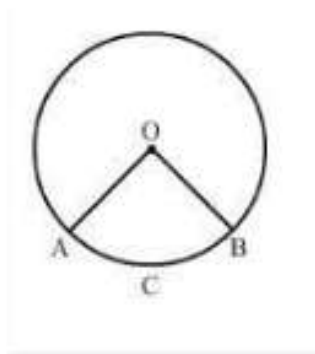


**Question 1:** The perimeter of a certain sector of a circle of radius 6.5 cm is 31 cm. Find the area of the sector.

**Solution:**

**Given:**

Radius = 6.5 cm



Let O be the centre of the circle with radius 6.5 cm and OACBO be its sector with perimeter 31 cm.

Thus, we have:

$$OA + OB + \text{arc } AB = 31 \text{ cm}$$

$$\Rightarrow 6.5 + 6.5 + \text{arc } AB = 31$$

$$\Rightarrow \text{arc } AB = 31 - 13$$

$$\Rightarrow \text{arc } AB = 18 \text{ cm}$$

Now,

$$\text{Area of the sector OACBO} = \frac{1}{2} \times \text{Radius} \times \text{Arc} = \frac{1}{2} \times 6.5 \times 18 = 58.5 \text{ cm}^2$$

**Question 2:** The radius of a circle is 17.5 cm. Find the area of the sector enclosed by two radii and an arc 44 cm in length.

**Solution:**

**Given:**

Radius = 17.5 cm

Length of the arc = 44 cm

Now,

$$\text{Length of the arc} = \frac{2\pi r\theta}{360}$$

$$\Rightarrow 44 = 2 \times \frac{22}{7} \times 17.5 \times \frac{\theta}{360}$$

$$\Rightarrow \theta = \frac{44 \times 7 \times 360}{44 \times 17.5}$$

$$\Rightarrow \theta = 144^\circ$$

Also,

$$\text{Area of the sector} = \frac{\pi r^2 \theta}{360} = \frac{22}{7} \times 17.5 \times 17.5 \times 144 = 385 \text{ cm}^2$$

**Question 3:** Two circular pieces of equal radii and maximum area, touching each other are cut out from a rectangular cardboard of dimensions 14 cm x 7 cm. Find the area of the remaining cardboard.

**Solution:**

We know that we can cut two circular pieces of equal radii and maximum area from the rectangular cardboard whose diameter is equal to the width of the rectangular cardboard.

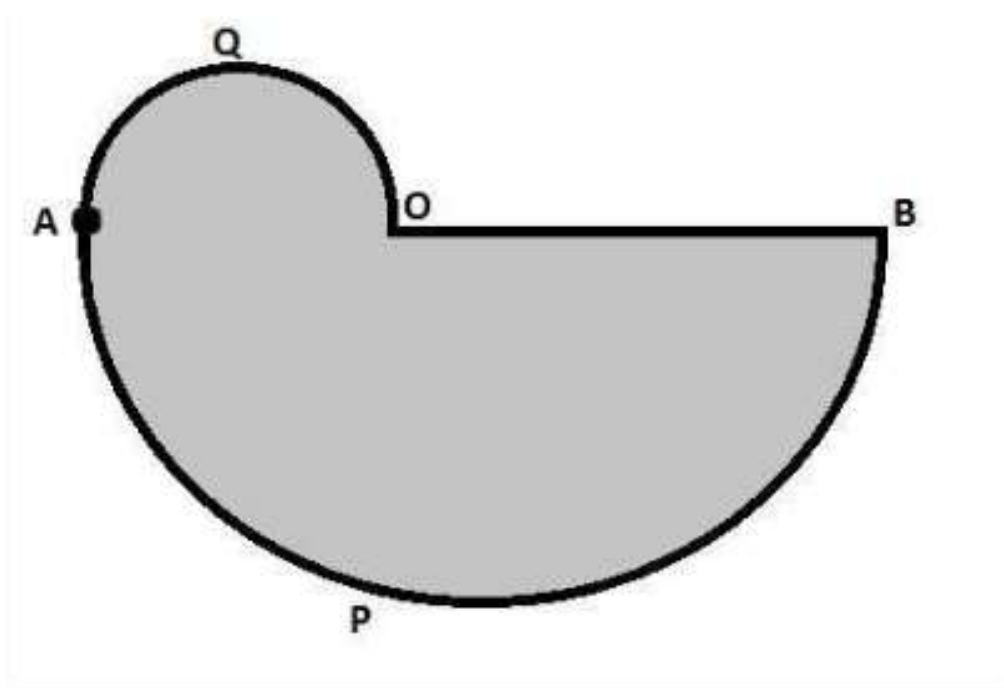
Therefore, Radii of two circular pieces = Half of the width of the rectangular cardboard = 3.5 cm

Now,

$$\begin{aligned} \text{Area of remaining cardboard} &= \text{Area of rectangular cardboard} - 2 \times \text{Area of circular piece having radius 3.5 cm} \\ &= 14 \times 7 - 2\left(\frac{22}{7} \times 3.5 \times 3.5\right) = 98 - 77 = 21 \text{ cm}^2 \end{aligned}$$

Hence, the area of the remaining cardboard is 21 cm<sup>2</sup>

Question 1: In the given figure, APB and AQO are semi-circles and  $AO = OB$ . If the perimeter of the figure is 40 cm, find the area of the shaded region.



**Solution:**

Perimeter of shaded region = Length of the arc AQO + Length of the arc APB + Length of OB

$$\Rightarrow 40 = \frac{1}{2} \times 2\pi \left( \frac{AO}{2} \right) + \frac{1}{2} \times 2\pi(OB) + OB$$

$$\Rightarrow 40 = \frac{11}{7}AO + \frac{22}{7}OB + OB$$

$$\Rightarrow 40 = \frac{11}{7}OB + \frac{22}{7}OB + OB \text{ [Since, } AO = OB\text{]}$$

$$\Rightarrow 40 = \frac{40}{7}OB$$

$$\Rightarrow OB = 7 \text{ cm}$$

Area of the shaded portion = Area of semicircle AQO + Area of semicircle APB

$$= \frac{1}{2}\pi\left(\frac{7}{2}\right)^2 + \frac{1}{2}\pi(7)^2$$

$$= \frac{1}{2} \times \frac{22}{7} \times \left(\frac{7}{2}\right)^2 + \frac{1}{2} \times \frac{22}{7} \times (7)^2 = 96.25 \text{ cm}^2$$

Hence, the area of the shaded portion is  $96.25 \text{ cm}^2$ .

**Question 2:** Find the area of a quadrant of a circle whose circumference is 44 cm.

**Solution:**

Let the radius of the circle be  $r$ .

Now,

Circumference = 44

$$\Rightarrow 2\pi r = 44$$

$$\Rightarrow r = 7 \text{ cm}$$

Now,

$$\text{Area of quadrant} = \frac{1}{4}\pi r^2 = \frac{1}{4} \times \frac{22}{7} \times (7)^2 = 38.5 \text{ cm}^2$$

Hence, the area of the quadrant of the circle is  $38.5 \text{ cm}^2$ .

**Q.1:** A sector is cut from a circle of radius 21 cm. The angle of the sector is  $150^\circ$ . Find the length of the arc and the area of the sector.

**Sol:**

Given:

Radius = 21 cm

Angle of sector =  $150^\circ$

Now,

$$\text{Length of arc} = \frac{2\pi r\theta}{360}$$

$$= \frac{2 \times \frac{22}{7} \times 21 \times 150}{360}$$

$$= 55 \text{ cm}$$

$$\text{Area of the sector} = \frac{\pi r^2\theta}{360}$$

$$= \frac{\frac{22}{7} \times 21 \times 21 \times 150}{360} = 577.5 \text{ cm}^2$$

**Q.2:** The area of the sector of a circle of radius 10.5 cm is  $69.3 \text{ cm}^2$ . Find the central angle of the sector.

**Sol:**

Given

Area of the sector =  $69.3 \text{ cm}^2$

Radius = 10.5 cm

Now,

$$\text{Area of the sector} = \frac{\pi r^2\theta}{360}$$

$$\Rightarrow 69.3 = \frac{\frac{22}{7} \times 10.5 \times 10.5 \times \theta}{360}$$

$$\Rightarrow \theta = \frac{69.3 \times 7 \times 360}{22 \times 10.5 \times 10.5}$$

$$\Rightarrow \theta = 72^\circ$$

Therefore, Central angle of the sector =  $72^\circ$