CBSE Class 10- Mathematics: Chapter – 12 Areas Related to Circles Part 12

Question 33:

Find the area of a quadrant of a circle whose circumference is $22\,cm$.

Answer:

Circumference $= 22\,cm$

$$2\pi r = 22$$

$$\Rightarrow r = \frac{22}{2\pi} = \frac{11}{\pi}$$

Quadrant of circle will subtend 90° angle at the centre of the circle.

Area of such quadrant of the circle $= \frac{90^\circ}{360^\circ} \times \pi \times r^2$

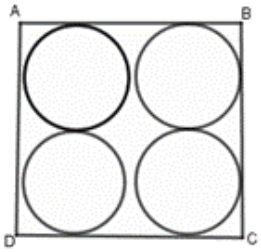
$$= \frac{1}{4\pi} \times \pi \times \left(\frac{11}{\pi}\right)^2$$

$$= \frac{121}{4\pi} = \frac{121 \times 7}{4 \times 22}$$

$$= \frac{77}{8} cm^2$$

Question 34:

Find the area of the shaded region where ABCD is a square of side $14cm$.



Answer:

Area of square $ABCD = 14 \times 14cm^2 = 196cm^2$

Diameter of each circle $= \frac{14}{2} = 7cm$

$\therefore$ Radius of each circle $= \pi r^2 = \frac{22}{7} \times \left(\frac{7}{2}\right)^2$

Area of circles $= 4 \times \frac{22}{7} \times \left(\frac{7}{2}\right)^2 = 154cm^2$

Area of shaded region = Area of square – Area of circles

$= 196cm^2 - 154cm^2 = 42cm^2$

Question 35:

The radius of a radius of a circle is $20cm$. Three more concentric circles are drawn inside it in such a manner that it is divided into four parts of equal area. Find the radius of the largest of the three concentric circles.

Answer:

Let r be the radius of the largest of the three circles

Area of largest circle $= \frac{3}{4}$ [area of given circle]

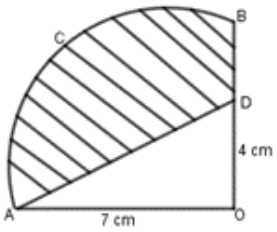
$\therefore \pi r^2 = \frac{3}{4}\pi(20)^2$

$\Rightarrow r^2 = 300$

$\Rightarrow r = \sqrt{300} = 10\sqrt{3}$

Question 36:

OACB is a quadrant of a circle with center O and radius $7\,cm$. If $OD = 4cm$, then find area of shaded region.



Answer:

Area of quadrant $OACB = \frac{90}{360}\pi(7)^2$

$= \frac{49}{4} \times \frac{22}{7} = \frac{77}{2}cm^2$

Area of shaded region = Area of quadrant

$OACB - \text{area of } \Delta OAD$

$= \frac{77}{2} - \frac{1}{2}(7 \times 4) = \frac{77}{2} - 14 = \frac{49}{2}$

$= 24.5cm^2$

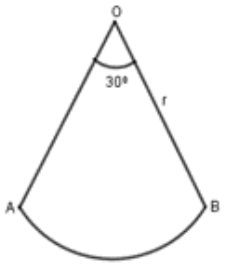
Question 37:

A pendulum swings through on angle of 30° and describes an arc 8.8 cm in length. Find the length of pendulum.

Answer:

Let be the length of pendulum

$\angle AOB = 30^\circ = \frac{\pi}{180^\circ} \times 30^\circ = \frac{\pi}{6}$



$\theta = \frac{l}{r}$

$\Rightarrow \frac{\pi}{6} = \frac{8.8}{r}$

$\Rightarrow r = \frac{8.8 \times 6}{\pi}$

$= 16.8cm$