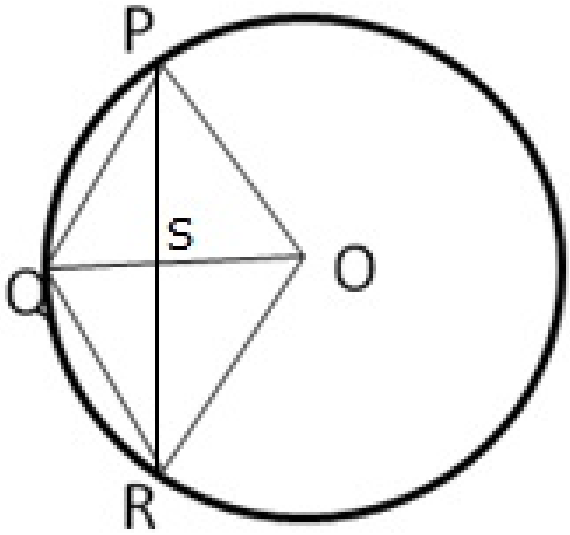
Question 20:



OP = OR = OQ = r
Let OQ and PR intersect at S
We know the diagonals of a rhombus bisect each other at right angle.
Therefore we have

$$OS = \frac{1}{2}r \text{ and } \angle OSR = 90^\circ$$

$$\therefore SR = \sqrt{OR^2 - OS^2}$$

$$= \sqrt{r^2 - \frac{r^2}{4}} = \frac{\sqrt{3}r}{2}$$

$$\therefore PR = 2 \times SR = \sqrt{3}r$$

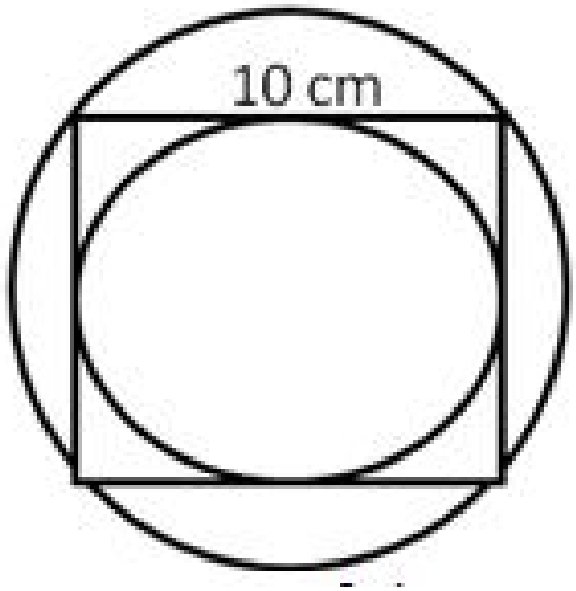
$$\text{Area of rhombus} = \frac{1}{2} \times OQ \times PR$$

$$= \frac{1}{2} \times r \times \sqrt{3}r = \frac{\sqrt{3}r^2}{2}$$

$$\therefore \frac{\sqrt{3}r^2}{2} = 32\sqrt{3} \Rightarrow r^2 = \frac{32\sqrt{3}}{\sqrt{3}} \times 2 = 64 \text{cm}$$

$$r = 8 \text{ cm}$$

Question 21:
Diameter of the inscribed circle = Side of the square = 10 cm
Radius of the inscribed circle = 5 cm

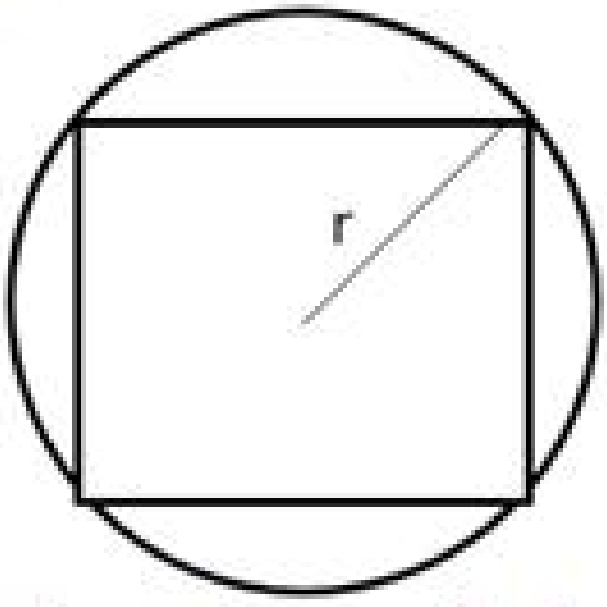


Diameter of the circumscribed circle
= Diagonal of the square
= (√2×10) cm
Radius of circumscribed circle = $5\sqrt{2}$ cm

(i) Area of inscribed circle = $\left(\frac{22}{7} \times 5 \times 5\right) = 78.57\ cm^2$

(ii) Area of the circumscribed circle = $\left(\frac{22}{7} \times 5\sqrt{2} \times 5\sqrt{2}\right) = 157.14\,cm^2$

Question 22:
Let the radius of circle be r cm



Then diagonal of square = diameter of circle = 2r cm
Area of the circle = πr^2 cm^2

$$\text{Area of square} = \frac{1}{2} \times (\text{diagonal})^2$$

$$= \frac{1}{2} \times 4r^2 = 2r^2\ \text{cm}$$

$$\text{Ratio} = \frac{\text{Area of circle}}{\text{Area of square}} = \frac{\pi r^2}{2r^2} = \frac{\pi}{2} = (\pi : 2)$$

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