



Areas Related to Circles Ex 15.1 Q10

**Answer :**

It is given that the side of square is 10 cm.

So, the diameter of circle inscribed the square is 10 cm.

We know that the area  $A$  of circle inscribed the square is

$$A = \pi r^2$$

Substituting the value of radius of inscribed circle  $r = 5$  cm ,

$$A = 3.14 \times 5 \times 5$$

$$= \boxed{78.5 \text{ cm}^2}$$

Hence the area of circle inscribed the square is  $\boxed{78.5 \text{ cm}^2}$

Now we will find the diameter of circle circumscribed the square.

diameter of circle circumscribed the square = diameter of square

$$= \sqrt{(10)^2 + (10)^2}$$

$$= 10\sqrt{2} \text{ cm}$$

So, radius of circle circumscribed the square =  $5\sqrt{2}$  cm

We know that the area  $A'$  of circle inscribed the square is

$$A' = \pi r'^2$$

Substituting the value of radius,

$$A' = 3.14 \times 5\sqrt{2} \times 5\sqrt{2}$$

$$= \boxed{157 \text{ cm}^2}$$

Hence the area of circle circumscribed the square is  $\boxed{157 \text{ cm}^2}$ .

Areas Related to Circles Ex 15.1 Q11

**Answer :**

Let the radius of two circles be  $r_1$  cm and  $r_2$  cm respectively. Then their circumferences are

$C_1 = 2\pi r_1$  cm and  $C_2 = 2\pi r_2$  cm respectively and their areas are  $A_1 = \pi r_1^2$  cm<sup>2</sup> and  $A_2 = \pi r_2^2$  cm<sup>2</sup> respectively.

It is given that the sum of the radii of two circles is 140 cm and difference of their circumferences is 88 cm. So,

$$r_1 + r_2 = 140 \text{ cm} \dots\dots (A)$$

$$C_1 - C_2 = 88 \text{ cm}$$

$$2\pi r_1 - 2\pi r_2 = 88 \text{ cm}$$

$$2\pi(r_1 - r_2) = 88 \text{ cm}$$

$$r_1 - r_2 = \frac{88}{2\pi} \text{ cm}$$

$$r_1 - r_2 = \frac{88}{2 \times \frac{22}{7}} \text{ cm}$$

$$r_1 - r_2 = \frac{88 \times 7}{44} \text{ cm}$$

$$r_1 - r_2 = 14 \text{ cm} \dots\dots (B)$$

Now, solving (A) and (B)

$$r_1 = 77 \text{ cm}$$

$$r_2 = 63 \text{ cm}$$

Thus diameters of circles are,

$$2r_1 = 154 \text{ cm}$$

$$2r_2 = 126 \text{ cm}$$

Areas Related to Circles Ex 15.1 Q12

**Answer :**

It is given that the area  $A$  of circle inscribed in an equilateral triangle is  $154 \text{ cm}^2$ .

We know that the area  $A$  of circle inscribed in an equilateral triangle is

$$A = \pi r^2$$

Now, we will find the value of  $r$ .

Substituting the value of area,

$$154 = 3.14 \times r^2$$

$$r^2 = \frac{154}{3.14}$$

$$r^2 = 49$$

$$r = \sqrt{49}$$

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

Let the height of triangle be  $h$ . Then

$$r = \frac{h}{3}$$

$$h = 3r$$

$$= 3 \times 7$$

$$= 21 \text{ cm}$$

If  $a$  is the side of triangle, then

$$h = \frac{\sqrt{3}}{2} a$$

$$a = \frac{2h}{\sqrt{3}}$$

Substituting the value of  $h$ ,

$$a = \frac{2 \times 21}{\sqrt{3}}$$

$$= 14\sqrt{3} \text{ cm}$$

$$\text{perimeter of triangle} = 3a$$

$$= 3 \times 14\sqrt{3}$$

$$= 42 \times 1.732$$

$$= \boxed{72.7 \text{ cm}}$$

Hence perimeter of triangle is  $\boxed{72.7 \text{ cm}}$ .

\*\*\*\*\* END \*\*\*\*\*