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 $r = 5\text{ cm}$,

$$A = 3.14 \times 5 \times 5$$
$$= \boxed{78.5\text{ cm}^2}$$

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.

$$\text{diameter of circle circumscribed the square} = \text{diameter of square}$$
$$= \sqrt{(10)^2 + (10)^2}$$
$$= 10\sqrt{2}\text{ cm}$$

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

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^2 and $A_2 = \pi r_2^2$ cm^2 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,

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

$$C_1 - C_2 = 88\text{ cm}$$
$$2\pi r_1 - 2\pi r_2 = 88\text{ cm}$$
$$2\pi(r_1 - r_2) = 88\text{ cm}$$
$$r_1 - r_2 = \frac{88}{2\pi}\text{ cm}$$
$$r_1 - r_2 = \frac{88}{2 \times \frac{22}{7}}\text{ cm}$$

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

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

Now, solving (A) and (B)

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

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

Thus diameters of circles are,

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

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

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 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 **********