



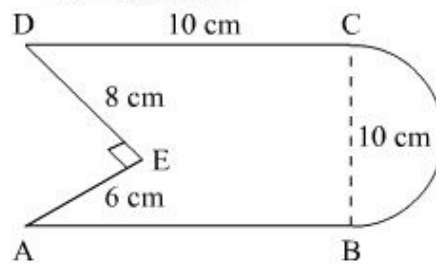
Areas Related to Circles Ex 15.4 Q13

Answer :

Let the area of square ABCD be A .

It is given that, $AB = 10 \text{ cm}$

So, $A = 10 \times 10 \text{ cm}^2$



It is given that a semicircle is attached to one side of the square.

The diameter of semicircle $= 10 \text{ cm}$

So, radius r of semicircle $= 5 \text{ cm}$

We know that the area of semicircle of radius r is

$$A' = \frac{1}{2} \pi r^2$$

Substituting the value of r ,

$$\begin{aligned} A' &= \frac{1}{2} \times \frac{22}{7} \times 5 \times 5 \\ &= 39.3 \text{ cm}^2 \end{aligned}$$

From the above figure it is seen that a right angle triangle is cutoff from one side of square.

$$\begin{aligned} \text{The area of right angle triangle} &= \frac{1}{2} bh \\ &= \frac{1}{2} \times 8 \times 6 \\ &= 24 \text{ cm}^2 \end{aligned}$$

Now, the area A'' of above figure is,

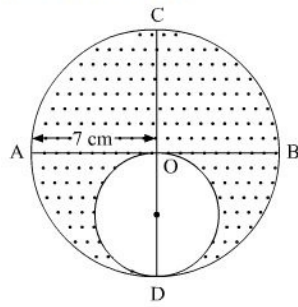
$$\begin{aligned} A'' &= \text{Area of square} + \text{Area of semicircle} - \text{Area of triangle} \\ &= 100 + 39.3 - 24 \\ &= \boxed{115.3 \text{ cm}^2} \end{aligned}$$

Hence area of given figure is $\boxed{115.3 \text{ cm}^2}$

Areas Related to Circles Ex 15.4 Q14

Answer :

It is given that AB and CD are two diameters of a circle perpendicular to each other and OD is the diameter of small circle.



It is given that, $OA = 7 \text{ cm}$
So, radius r of small circle is

$$r = \frac{7}{2} \text{ cm} \\ = 3.5 \text{ cm}$$

We know that the area A of circle of radius r is $A = \pi r^2$.

Substituting the value of r in above formula,

$$A = \frac{22}{7} \times 3.5 \times 3.5 \\ = 38.5 \text{ cm}^2$$

Now, let the area of large circle be A' .

Using the value radius OA ,

$$A' = \frac{22}{7} \times 7 \times 7 \\ = 154 \text{ cm}^2$$

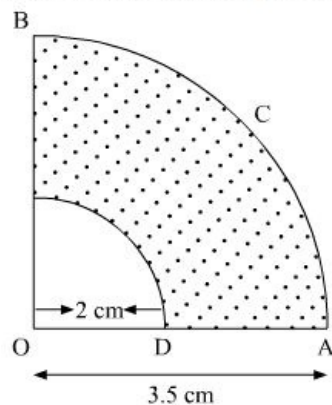
Hence,

$$\begin{aligned} \text{Area of shaded region} &= \text{Area of large circle} - \text{Area of small circle} \\ &= 154 - 38.5 \\ &= \boxed{115.5 \text{ cm}^2} \end{aligned}$$

Areas Related to Circles Ex 15.4 Q15

Answer :

It is given that OACB is a quadrant of circle with centre at O and radius 3.5 cm.



(i) We know that the area of quadrant of circle of radius r is,

$$A = \frac{1}{4} \pi r^2$$

Substituting the value of radius $r = 3.5 \text{ cm}$,

$$A = \frac{1}{4} \times \frac{22}{7} \times 3.5 \times 3.5 \\ = \boxed{9.625 \text{ cm}^2}$$

Hence, the area of OACB is $\boxed{9.625 \text{ cm}^2}$.

(ii) It is given that radius of quadrant of small circle is 2 cm.

Let the area of quadrant of small circle be A' .

$$\begin{aligned}A' &= \frac{1}{4} \pi r^2 \\&= \frac{1}{4} \times \frac{22}{7} \times 2 \times 2 \\&= 3.14 \text{ cm}^2\end{aligned}$$

It is clear from the above figure that area of shaded region is the difference of larger quadrant and the smaller one. Hence,

$$\begin{aligned}\text{Area of shaded region} &= A - A' \\&= 9.625 - 3.14 \\&= \boxed{6.485 \text{ cm}^2}\end{aligned}$$

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