



Surface Area and volume of A Right Circular cylinder Ex 19.1 Q5

Answer :

The data given in this problem is as follows:

Total Surface Area of the cylinder = 462 cm²

Curved Surface Area (CSA) = $\frac{1}{3}$ Total Surface Area (TSA)

We have to find the radius and the height of the cylinder.

Using the given data, we have

$$\frac{CSA}{TSA} = \frac{1}{3}$$

Substituting the formula for Curved Surface Area and Total Surface Area in the above equation, we have

$$\frac{2\pi rh}{2\pi rh + 2\pi r^2} = \frac{1}{3}$$

$$\frac{2\pi rh}{2\pi r(h+r)} = \frac{1}{3}$$

$$\frac{h}{h+r} = \frac{1}{3}$$

$$3h = h+r$$

$$2h = r$$

$$h = \frac{r}{2}$$

We have,

Total Surface Area = 462 cm²

Substituting the formula for Total Surface Area in the above equation, we get

$$2\pi rh + 2\pi r^2 = 462$$

$$2\pi r(h+r) = 462$$

$$\text{Now, we know that } h = \frac{r}{2}$$

Substituting this in the above equation, we have

$$2 \times \pi \times r \left(\frac{r}{2} + r \right) = 462$$

$$2 \times \pi \times r \left(\frac{3r}{2} \right) = 462$$

$$3\pi r^2 = 462$$

$$r^2 = \frac{462 \times 7}{22 \times 3}$$

$$r = 7$$

$$\text{Since } h = \frac{r}{2}$$

$$h = \frac{7}{2} = 3.5$$

Therefore, the final answer to this question is,

Radius of the cylinder = 7cm

Height of the cylinder = 3.5cm

Surface Area and volume of A Right Circular cylinder Ex 19.1 Q6

Answer :

Data given is the problem is as follows:

The cylinder is a hollow cylinder and is open on both sides

Total surface area of the cylinder is 4620 square centimeters

Area of the base ring = 115.5 square centimeters

Height = 7 cm

We are supposed to find the thickness of this cylinder.

We know that,

Total surface area of a hollow cylinder = $2\pi rh + 2\pi Rh + 2\pi R^2 - 2\pi r^2$

Where, r is the inner radius and R is the outer radius of the cylinder.

Now we have,

$$2\pi rh + 2\pi Rh + 2\pi R^2 - 2\pi r^2 = 4620$$

Also, $h = 7$ cm

$$2\pi h(r + R) + 2(\pi R^2 - \pi r^2) = 4620$$

Also, it is given that

Area of base ring = 115.5

That is, $\pi R^2 - \pi r^2 = 115.5$ (1)

$$\pi(R^2 - r^2) = 115.5$$

Substituting for $\pi R^2 - \pi r^2$ in the above equation, we have

$$2\pi h(r + R) + 2(115.5) = 4620$$

$$2\pi h(r + R) = 4389$$

Also, $h = 7$

Therefore,

$$2 \times \frac{22}{7} \times 7(r + R) = 4389$$

$$R + r = 99.75 \text{(2)}$$

Now let us again take up equation (1)

$$\pi R^2 - \pi r^2 = 115.5$$

$$\pi(R^2 - r^2) = 115.5$$

$$\frac{22(R^2 - r^2)}{7} = 115.5$$

$$(R^2 - r^2) = 115.5 \times \frac{7}{22}$$

$$(R - r)(R + r) = 115.5 \times \frac{7}{22}$$

From equation (2) we have $R + r = 99.75$. Substitute this in the above equation.

$$99.75(R - r) = 115.5 \times \frac{7}{22}$$

$$(R - r) = \frac{7}{19}$$

$(R - r)$ is nothing but the thickness of the cylinder.

Therefore, the thickness of the cylinder is $\frac{7}{19}$ cm

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