

MATHEMATICS
CLASS - X

Chapter 8 : (Right circular cylinder)

1. If the radius of base of a right circular cylinder is 7 cm. and the lateral surface area is 528 sq. cm., then what is the volume of the cylinder?

Ans. Let the height of the cylinder be h cm.

It is given that radius of base (r cm.) = 7 cm.

∴ The area of the lateral surface

$$2\pi rh = 528$$

or, $2 \times \frac{22}{7} \times 7 \times h = 528$

∴ $h = \frac{528}{2 \times 22} = 12$

∴ volume = $\pi r^2 h$ cubic cm.
= $\frac{22}{7} \times 7 \times 7 \times 12$ cubic cm.
= 1848 cubic cm.

2. If the lateral surface area of a right circular cylinder pillar is 264 sq.metre and volume is 924 cubic metre, then find the diameter and height of the pillar.

Ans. Let the radius of the base of the right circular cylindrical pillar be r meter and the height of the pillar be h meter.

According to the question,

$$2\pi rh = 264 \quad \text{and} \quad \pi r^2 h = 924$$

∴ $\frac{\pi r^2 h}{2\pi rh} = \frac{924}{264}$

or, $\frac{r}{2} = \frac{924}{264}$

∴ $r = \frac{924}{264} \times 2 = 7$

∴ diameter = 7×2 m. = 14 m.

Now, $2 \times \frac{22}{7} \times 7 \times h = 264$

∴ $h = \frac{264}{2 \times 22} = 6$

∴ Height = 6 m.

3. The length of inner and outer diameter of a right circular cylindrical pipe open at two ends are 30 cm. and 26 cm. respectively and the length of pipe is 14.7 metre. What is the cost of painting its all surface with coaltar at Rs. 2.25 per dcm.?

Ans. Let the outer radius of the pipe be R dcm.

and the inner radius of the pipe be r dcm.

$$\text{It is given that } 2R = 30 \quad \therefore \quad R = \frac{30}{2} = 15$$

$$\text{and } 2r = 26 \quad \therefore \quad r = \frac{26}{2} = 13$$

The length of the pipe is = 14.7 m. = 147 dcm.

\therefore The total surface area of the pipe is

$$\begin{aligned} & 2\pi(R+r)h + 2\pi(R^2 - r^2) \text{ sq. dcm.} \\ = & 2\pi[(15+13)\times 147 + (15)^2 - (13)^2] \text{ sq. dcm.} \\ = & 2\pi[28\times 147 + 28\times 0.2] \text{ sq. dcm.} \\ = & 2\times \frac{22}{7}\times 28\times 147.2 \text{ sq. dcm.} \\ = & 44\times 0.4\times 147.2 \text{ sq. dcm.} \\ = & 2590.72 \text{ sq. dcm.} \end{aligned}$$

The cost of painting coaltar is Rs. 2.25 per dcm.

\therefore The total cost of painting is = Rs. (2590.72×2.25) = Rs. 5829.12.