



NCERT Solutions for Class 10 Maths Chapter 13 Surface Areas and Volumes Exercise 13.2

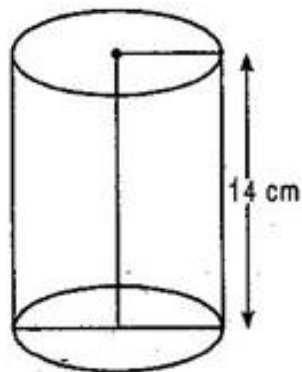
Exercise 13.2

Assume $\pi = \frac{22}{7}$ unless stated otherwise

1. The curved surface area of a right circular cylinder of height 14 cm is 88 cm^2 . Find the diameter of the base of the cylinder.

Ans. Given: Height of cylinder (h) = 14 cm, Curved Surface Area = 88 cm^2

Let radius of base of right circular cylinder = r cm



$$2\pi rh = 88$$

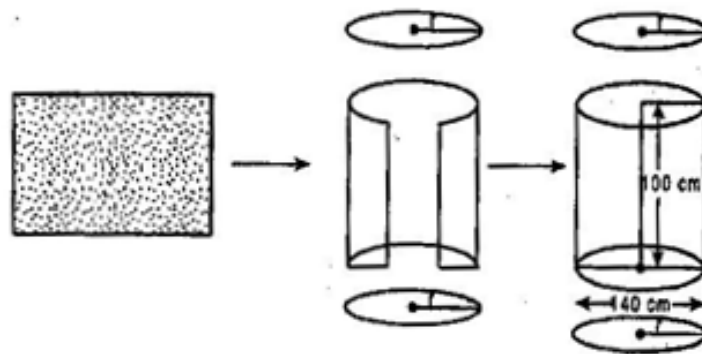
$$\Rightarrow 2 \times \frac{22}{7} \times r \times 14 = 88$$

$$\Rightarrow r = 88 \times \frac{7}{22} \times \frac{1}{14} \times \frac{1}{2}$$

$$\Rightarrow r = 1 \text{ cm}$$

Diameter of the base of the cylinder = $2r = 2 \times 1 = 2$ cm

2. It is required to make a closed cylindrical tank of height 1 m and base diameter 140 cm from a metal sheet. How many square meters of the sheet are required for the same?



Ans. Given: Diameter = 140 cm

\Rightarrow Radius (r) = 70 cm = 0.7 m

Height of the cylinder (h) = 1 m

Total Surface Area of the cylinder

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

$$= 2 \times \frac{22}{7} \times 0.7(0.7 + 1)$$

$$= 2 \times 22 \times 0.1 \times 1.7 = 7.48 \text{ m}^2$$

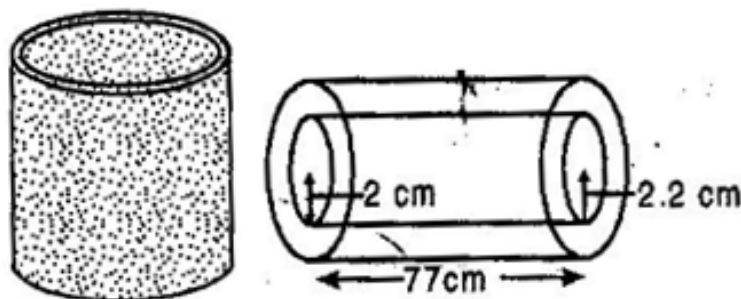
Hence 7.48 m² metal sheet is required to make the close cylindrical tank.

3. A metal pipe is 77 cm long. The inner diameter of a cross section is 4 cm, the outer diameter being 4.4 cm. [See fig.]. Find its:

(i) Inner curved surface area

(ii) Outer curved surface area

(iii) Total surface area



Ans. (i) Length of the pipe = 77 cm, Inner diameter of cross-section = 4 cm

\Rightarrow Inner radius of cross-section = 2 cm

Inner curved surface area of pipe = $2\pi rh$ =

$$2 \times \frac{22}{7} \times 2 \times 77$$

$$= 2 \times 22 \times 2 \times 11 = 968 \text{ cm}^2$$

(ii) Length of pipe = 77 cm, Outer diameter of pipe = 4.4 cm

\Rightarrow Outer radius of the pipe = 2.2 cm

Outer surface area of the pipe = $2\pi rh$

$$= 2 \times \frac{22}{7} \times 2.2 \times 77$$

$$= 44 \times 2.2 \times 11 = 1064.8 \text{ cm}^2$$

(iii) Now there are two circles of radii 2 cm and 2.2 cm at both the ends of the pipe.

\therefore Area of two edges of the pipe = 2 (Area of outer circle – area of inner circle)

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

$$= 2 \times \frac{22}{7} [(2.2)^2 - (2)^2] = \frac{44}{7} (4.84 - 4)$$

$$= \frac{44}{7} \times 0.84 = 5.28 \text{ cm}^2$$

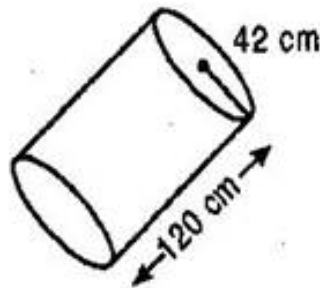
\therefore Total surface area of pipe

= Inner curved surface area + Outer curved surface area + Area of two edges

$$= 968 + 1064.8 + 5.28 = 2038.08 \text{ cm}^2$$

4. The diameter of a roller is 84 cm and its length is 120 cm. It takes 500 complete revolutions to move once over to level a playground. Find the area of the playground in m^2 .

Ans. Diameter of roller = 84 cm



\Rightarrow Radius of the roller = 42 cm

Length (Height) of the roller = 120 cm

Curved surface area of the roller = $2\pi rh$

$$= 2 \times \frac{22}{7} \times 42 \times 120 = 31680 \text{ cm}^2$$

$$= 3.1680 \text{ m}^2$$

\therefore Now area leveled by roller in one revolution = 3.1680 m^2

\therefore Area leveled by roller in 500 revolutions

$$= 3.1680 \times 500 = 1584.0000 = 1584 \text{ m}^2$$

5. A cylindrical pillar is 50 cm in diameter and 3.5 m in height. Find the cost of white washing the curved surface of the pillar at the rate of Rs. 12.50 per m^2 .

Ans. Diameter of pillar = 50 cm

$$\Rightarrow \text{Radius of pillar} = 25 \text{ cm} = \frac{25}{100} = \frac{1}{4} \text{ m}$$

Height of the pillar = 3.5 m

Now, Curved surface area of the pillar

$$= 2\pi rh$$

$$= 2 \times \frac{22}{7} \times \frac{1}{4} \times 3.5 = \frac{11}{2} \text{ m}^2$$

$$\therefore \text{Cost of white washing } 1 \text{ m}^2 = \text{Rs. } 12.50$$

$$\therefore \text{Cost of white washing } \frac{11}{2} \text{ m}^2$$

$$= 12.50 \times \frac{11}{2} = \text{Rs. } 68.75$$

6. Curved surface area of a right circular cylinder is 4.4 m^2 . If the radius of the base of the cylinder is 0.7 m , find its height.

Ans. Curved surface area of the cylinder

$$= 4.4 \text{ m}^2, \text{ Radius of cylinder} = 0.7 \text{ m}$$

Let height of the cylinder = h

$$\therefore 2\pi rh = 4.4$$

$$\Rightarrow 2 \times \frac{22}{7} \times 0.7 \times h = 4.4$$

$$\Rightarrow h = 4.4 \times 7 \times \frac{1}{22} \times \frac{1}{2}$$

$$\Rightarrow h = 1 \text{ m}$$

***** END *****