

Answer the following:

1. The volume of a right circular cylinder is $896\pi\text{cm}^3$ and its height is 14 cm. Find the radius of its base?

Solution:

Height = 14 cm

Volume = $896\pi\text{cm}^3$

We know that Volume of a right circular cylinder = $\pi r^2 h = 896\pi$ (given)

$$r^2 \times 14 = 896$$

$$r^2 = \frac{896}{14} = 64$$

$$r = 8 \text{ cm}$$

2. Two cubes each of volume 216cm^3 are joined end to end. Find the surface area of the resulting cuboid?

Solution:

Given Volume = 216cm^3

Let the length of each edge of a cube be x cm, then $x^3 = 216\text{cm}^3$

$$x^3 = 6^3 \text{ which implies } x = 6 \text{ cm}$$

So length of the new cuboid = $6 + 6 = 12$ cm, breadth = 6 cm and height = 6cm

$$\text{Surface Area} = 2(lb + bh + lh) = 2(12 \times 6 + 6 \times 6 + 12 \times 6) = 2(72 + 36 + 72) = 2 \times 180 = 360\text{cm}^2.$$

3. The diameter of the base of a right circular cylinder is 14cm and its height is 7cm. Find

i) Volume

ii) Total Surface Area

iii) Curved Surface Area

Solution:

Diameter = 14cm

Radius = 7cm

Height = 7cm

$$\text{i) Volume} = \pi r^2 h = \frac{22}{7} \times 7 \times 7 \times 7 = 1078 \text{ cm}^3$$

$$\text{ii) Total Surface Area} = 2\pi r(r + h) = 2 \times \frac{22}{7} \times 7(7 + 7) = 616 \text{ cm}^2$$

$$\text{iii) Curved Surface Area} = 2\pi r h = 2 \times \frac{22}{7} \times 7 \times 7 = 308 \text{ cm}^2.$$

4. The radius of the base and the height of the right circular cone are 14cm and 27cm respectively. Find the volume and the total surface area of the cone?

Solution:

Radius = 14cm

Height = 27cm

$$\text{Volume} = \frac{1}{3} \pi r^2 h = \frac{1}{3} \times \frac{22}{7} \times 14 \times 14 \times 27 = 5544 \text{ cm}^3$$

$$\text{Slant height of the cone } l = \sqrt{r^2 + h^2} = \sqrt{14^2 + 27^2} = \sqrt{196 + 729} = \sqrt{925} = 30.4138 \text{ cm}$$

$$\text{Total Surface Area} = \pi r(r + l) = \frac{22}{7} \times 14(14 + 30.4138) = 1954.21 \text{ cm}^2$$

5. A cone of height 36cm and radius of base 9cm is made up of modelling clay. A child reshapes it in the form of a sphere. Find the radius of the sphere?

Solution:

$$\text{Volume of cone} = \frac{1}{3} \times \pi \times 9 \times 9 \times 36 \text{ cm}^3$$

If r is the radius of the sphere, then its volume is $\frac{4}{3} \pi r^3$.

Since, the volume of clay in the form of the cone and the sphere remains the same, we have

$$\frac{4}{3} \pi r^3 = \frac{1}{3} \times \pi \times 9 \times 9 \times 36$$

$$r^3 = 9^3$$

$$r = 9$$

Therefore, the radius of the sphere is 9cm.
