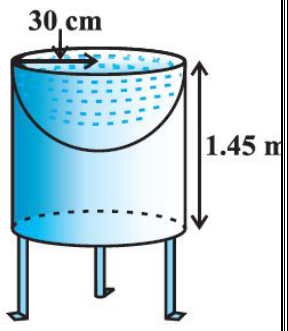
DAY 3

1. **Rahul made a bird-bath for his garden in the shape of a cylinder with a hemispherical depression at one end as shown in the figure. The height of the cylinder is 1.45m and its radius is 30 cm. Find the total surface area of the bird-bath. [Example 4]**

Sol:- Given Height of the cylinder $(h) = 1.45m = 145cm$

and radius of the cylinder (r) = radius of the hemisphere $= 30\ cm$



Total surface area of the bird − bath = (LSA of cylinder) +(LSA of hemisphere)

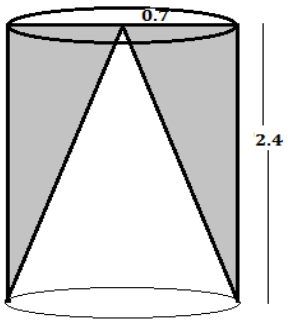
$$= 2\pi rh + 2\pi r^2 = 2\pi r(h + r)$$
$$= 2 \times \frac{22}{7} \times 30(145 + 30)$$
$$= 2 \times \frac{22}{7} \times 30 \times 175 = \mathbf{33000\ cm^2}$$

2. **From a solid cylinder whose height is 2.4 cm and diameter 1.4 cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid to the nearest cm^2. [Ex 13.1, Q8]**

Sol:- Given Diameter of the cylinder = Diameter of the Cone $= 1.4\ cm$

$\Rightarrow$ Radius of the cylinder (r) = Radius of the Cone $= 0.7\ cm$

and Height of the cylinder (h) = Height of the Cone $= 2.4\ cm$



Slant height of the cone $(l) = \sqrt{h^2 + r^2} = \sqrt{(2.4)^2 + (0.7)^2}$

$$= \sqrt{5.76 + 0.49} = \sqrt{6.25} = 2.5\ cm$$

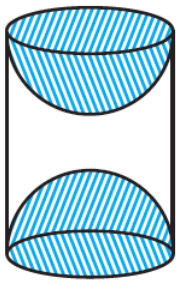
Total surface area of remaining solid = (LSA of cylinder) + (Area of base of Cylinder) + (LSA of Cone)

$$= 2\pi rh + \pi r^2 + \pi rl = \pi r(2h + r + l)$$
$$= \frac{22}{7} \times 0.7(2 \times 2.4 + 0.7 + 2.5)$$
$$= \frac{22}{7} \times 0.7(4.8 + 0.7 + 2.5) = 2.2 \times 8 = \mathbf{17.6\ cm^2}$$

3. **A wooden article was made by scooping out a hemisphere from each end of a solid cylinder, as shown in the diagram. If the height of the cylinder is 10 cm and base of radius is 3.5 cm. Find the total surface area of the article. [Ex 13.1, Q9]**

Sol:- Given Height of the cylinder $= 10\ cm$

$\Rightarrow$ Radius of the cylinder (r) = Radius of the hemisphere $= 3.5\ cm$



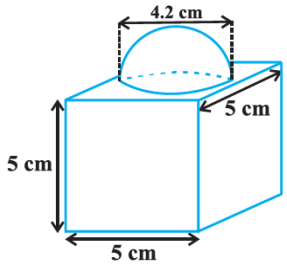
Total surface area of wooden article = (LSA of cylinder) +2 × (LSA of Hemisphere)

$$= 2\pi rh + 2 \times 2\pi r^2 = 2\pi r(h + 2r)$$
$$= 2 \times \frac{22}{7} \times 3.5(10 + 2 \times 3.5) = 2 \times \frac{22}{7} \times 3.5(10 + 7)$$
$$= 2 \times \frac{22}{7} \times 3.5 \times 17 = \mathbf{374\ cm^2}$$

4. A cubical block of side 7 cm is surmounted by a hemisphere. What is the greatest diameter the hemisphere can have? Find the surface area of the solid. [Ex 13.1, Q4]

Sol:- According to figure, side of the cube = diameter of the hemisphere $= 7\ cm$

$\Rightarrow$ Radius of the hemisphere$(r) = 3.5\ cm$



Total surface area of solid = 5 × (Faces of a cube)
+(Area of top face of cube − Area of circle) + (LSA of hemisphere)

$$= 5a^2 + (a^2 - \pi r^2) + 2\pi r^2 = 6a^2 + \pi r^2$$
$$= 6 \times 7 \times 7 + \frac{22}{7} \times 3.5 \times 3.5 = 294 + 38.5 = \mathbf{332.5\ cm^2}$$