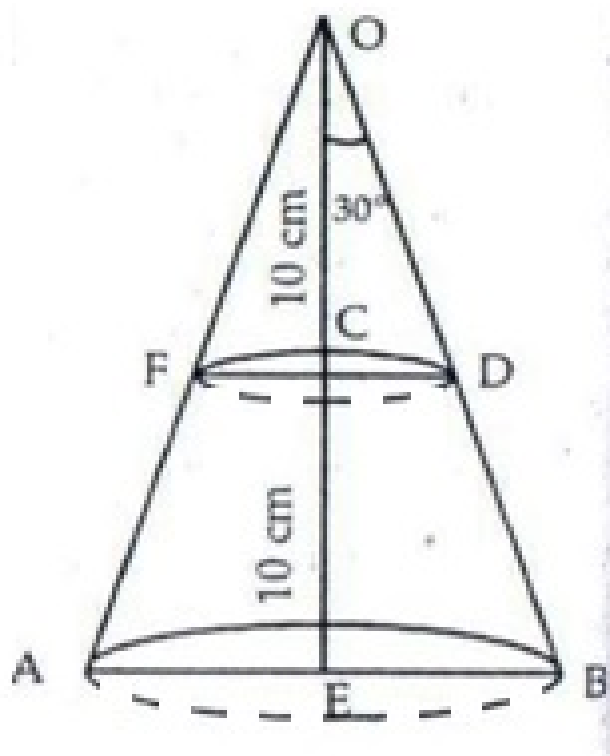




Exercise 19C

Question 8:



In the given figure, we have
 $\angle COD = 30^\circ$, $OC = 10\text{ cm}$, $OE = 20\text{ cm}$
Let $CD = r\text{ cm}$ and $EB = R\text{ cm}$

$$\begin{aligned}\frac{CD}{OC} &= \tan 30^\circ \\ \Rightarrow \frac{CD}{10} &= \frac{1}{\sqrt{3}} \\ \Rightarrow CD &= \left(10 \times \frac{1}{\sqrt{3}}\right) \text{ cm} \\ &= \frac{10}{\sqrt{3}} \text{ cm} \\ \frac{EB}{OE} &= \tan 30^\circ = \frac{EB}{20} = \frac{1}{\sqrt{3}} \\ \Rightarrow EB &= \left(20 \times \frac{1}{\sqrt{3}}\right) \text{ cm} \Rightarrow R = \frac{20}{\sqrt{3}} \text{ cm}\end{aligned}$$

Also, $CE = 10 \text{ cm}$

Thus, $ABDF$ is the frustum of a cone in which

$$R = \frac{20}{\sqrt{3}} \text{ cm}, r = \frac{10}{\sqrt{3}} \text{ cm} \text{ and } h = 10 \text{ cm}$$

$$\begin{aligned}\text{Volume of frustum} &= \frac{1}{3} \pi h (R^2 + r^2 + Rr) \\ &= \frac{1}{3} \times \pi \times 10 \times \left(\frac{400}{3} + \frac{100}{3} + \frac{200}{3}\right) \\ &= \left(\frac{\pi \times 10}{3} \times \frac{700}{3}\right) \text{ cm}^3 = \left(\frac{7000\pi}{9}\right) \text{ cm}^3\end{aligned}$$

Volume of wire of radius r and length l

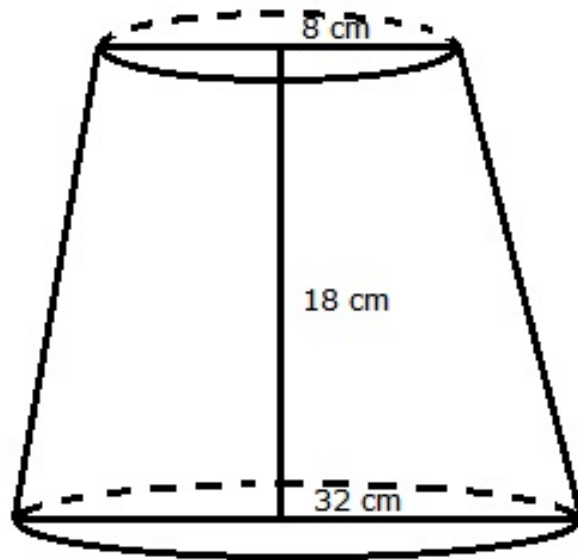
$$= \pi r^2 l = \pi \left[\frac{1}{32}\right]^2 l$$

Volume of wire = Volume of frustum

$$\begin{aligned}\pi \left(\frac{1}{32}\right)^2 l &= \frac{7000\pi}{9} \\ l &= \frac{7000 \times 32 \times 32}{9} \text{ cm} \\ &= \frac{70 \times 32 \times 32}{9} \text{ m} \\ &= 7964.44 \text{ m}\end{aligned}$$

Length of the wire is 7964.44 m

Question 9:



Radii of upper and lower end of frustum are $r = 8$ cm, $R = 32$ cm
 Height of frustum $h = 18$ cm

$$\begin{aligned}
 \text{Volume of frustum} &= \frac{1}{3} \pi h [R^2 + r^2 + R \times r] \\
 &= \frac{1}{3} \times \frac{22}{7} \times 18 \times [32^2 + 8^2 + 32 \times 8] \text{ cm}^3 \\
 &= \frac{22 \times 6}{7} [1024 + 64 + 256] \text{ cm}^3 \\
 &= \frac{132}{7} \times 1344 \text{ cm}^3 = 25344 \text{ cm}^3 = 25.344 \text{ litres}
 \end{aligned}$$

Cost of milk at Rs 20 per litre = Rs. 25.344×20 = Rs. 506. 88

***** END *****