Exercise 10.1

1 Sum: Find the volume of the right circular cone with (i) radius 6cm, height 7cm (ii) radius 3.5cm, height 12cm.

Sol (i) radius = 6cm
height = 7cm

Volume of Cone $= \frac{1}{3}\pi r^2 h$

$= \frac{1}{3} \times \frac{22}{7} \times (6)^2 \times 7$

$= \frac{1}{3} \times \frac{22}{7} \times 6 \times 6 \times 7$

$= 264\ cm^3$ Ans

(ii) radius = 3.5 cm
height = 12 cm

Volume of Cone $= \frac{1}{3}\pi r^2 h$

$= \frac{1}{3} \times \frac{22}{7} \times (3.5)^2 \times 12$

$= \frac{1}{3} \times \frac{22}{7} \times 3.5 \times 3.5 \times 12$

$= \frac{1}{3} \times \frac{22}{7} \times \frac{35}{10} \times \frac{35}{10} \times 12$

$= \frac{1540}{100}\ cm^3$

$= 154\ cm^3$ Ans

2 sum 19.7 : Find the Capacity in litres of a Conical vessel with (i) radius 7cm, slant height 25cm (ii) height 12cm, slant height 13cm.

Sol :

(i) radius = 7cm

slant height = 25cm

$l = \sqrt{r^2 + h^2}$

$l^2 = r^2 + h^2$

$(25)^2 = (7)^2 + h^2$

$625 = 49 + h^2$

$625 - 49 = h^2$

$\sqrt{576} = h$

$24\text{cm} = h$

Capacity of Conical Vessel $= \frac{1}{3}\pi r^2 h$

$= \frac{1}{3} \times \frac{22}{7} \times (7)^2 \times 24$

$= \frac{1}{3} \times \frac{22}{7} \times 7 \times 7 \times 24^8$

$= 1232\ cm^3$

$\frac{1232}{1000}\ l$

$= 1.232\ l$

(ii) height = 12cm, slant height = 13cm

$l^2 = r^2 + h^2$

$(13)^2 = r^2 + (12)^2$

$169 = r^2 + 144$

$169 - 144 = r^2$

$25 = r^2$

$\sqrt{25} = r$

$5\text{cm} = r$

Capacity of Conical Vessel $= \frac{1}{3}\pi r^2 h$

$= \frac{1}{3} \times \frac{22}{7} \times (5)^2 \times 12\ cm^3$

$= \frac{1}{3} \times \frac{22}{7} \times \frac{11}{5} \times \frac{4}{12} \times \frac{5}{40}$

$= \frac{11}{35}\ l$

3. Sum 13.7 ; The height of a cone is 15cm. If its volume is 1570cm^3, find the radius of the base. (use $\pi = 3.14$)

Sol: height of cone = 15cm

volume of cone = 1570

$$\frac{1}{3}\pi r^2 h = 1570$$

$$\frac{1}{3} \times 3.14 \times r^2 \times 15 = 1570$$

$$3.14 \times 5 \times r^2 = 1570$$

$$\frac{314}{100} \times 5 \times r^2 = 1570$$

$$r^2 = \frac{1570 \times 100}{314 \times 5}$$

$$r^2 = 100$$

$$r = \sqrt{100}$$

$$r = 10 \text{ cm.}$$ Ans

4 Sem / 13.7: If the volume of a right Circular Cone of height 9 cm is 48π cm^3, find the diameter of its base.

Sol: height of Cone = 9 cm

Volume of Cone = 48π cm^3

$$\frac{1}{3}\pi r^2 h = 48\pi \text{ cm}^3$$

$$\frac{1}{3}\pi r^2 \times 9 = 48\pi \text{ cm}^3$$

$$r^2 = \frac{48\pi \times 3}{\pi \times 9}$$

$$r^2 = 16$$

$$r = \sqrt{16}$$

$$r = 4 \text{ cm}$$

Diameter of its base = $2 \times 4 = 8$ cm. Ans

5. Sum: A Conical pit of a top diameter 3.5 m is 12 m deep. What is its Capacity in Kilalitres?

Sol.: Diameter of Conical pit = 3.5 m

Radius = $\frac{35}{10\times 2}$ m

height = 12 m

Capacity of Cone = $\frac{1}{3}\pi r^2 h$

$= \frac{1}{3}\times\frac{22}{7}\times\left(\frac{35}{20}\right)^2\times 12$

$= \frac{1}{\cancel{3}}\times\frac{22}{\cancel{7}}\times\frac{\cancel{35}^{5}}{\cancel{20}_{10}}\times\frac{35}{\cancel{20}_{10}}\times\cancel{12}^{\cancel{4}3}$

$= \frac{3850}{100}\ m^3$

$= 38.5\ m^3$

$= 38.5$ Kl Ans $\boxed{1\ m^3 = 1\ Kl}$

Q.No.1 The volume of a right circular cone is $9856\ cm^3$. If the diameter of the base is 28 cm, find (i) height of the cone (ii) slant height of the cone (iii) Curved surface area of the cone.

Sol: Diameter of cone = 28cm

Radius of cone = $\frac{28}{2}$ = 14cm

(i) Volume of cone = $9856 cm^3$

$$\frac{1}{3}\pi r^2 h = 9856$$

$$\frac{1}{3} \times \frac{22}{7} \times (14)^2 \times h = 9856$$

$$\frac{1}{3} \times \frac{22}{7} \times 14 \times 14 \times h = 9856$$

$$16 + 176 - h = \frac{9856 \times 3 \times 7}{22 \times 14 \times 14}$$

$$h = 16 \times 3$$

$$h = 48\ cm \quad Ans$$

(ii) Slant height $= \sqrt{r^2 + h^2}$

$$= \sqrt{(14)^2 + (48)^2}$$

$$l = \sqrt{196 + 2304} = \sqrt{2500} = 50cm \quad Ans$$

(iii) Curved surface area of cone $= \pi r l$

$$= \frac{22}{7} \times 14 \times 50$$

$$= 2200\ cm^2 \quad Ans$$

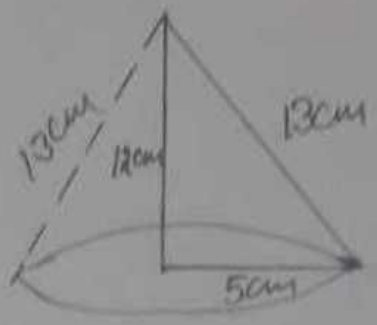
7 Sum 13.7 : A right triangle ABC with sides 5 cm, 12 cm and 13 cm is revolved about the side 12 cm, find the volume of solid so obtained.

Sol:

radius of Cone = 5 cm

slant height of Cone = 13 cm

height of Cone = 12 cm



Volume of solid $= \frac{1}{3}\pi r^2 h$

$= \frac{1}{3} \times \pi \times (5)^2 \times 12$

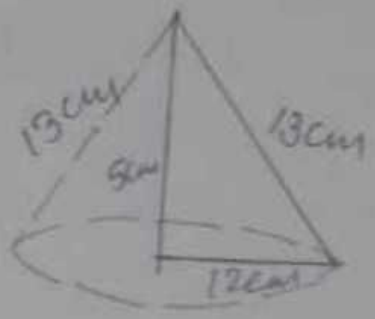
$= \frac{1}{3} \times \pi \times 25 \times 12^4$

$= 100\pi \text{ cm}^3$. Ans

13.7 Q. If the triangle ABC in the Question 7 above is resolved about the side 5cm, then find the volume of the solid so obtained. Find also the ratio of the volume of two solid obtained in Question 7 and 8.

Sol:

Radius of Cone = 12cm
Slant height of Cone = 13cm
height of Cone = 5cm



(i) Volume of Cone $= \frac{1}{3}\pi r^2 h$

$= \frac{1}{3}\pi (12)^2 \times 5$

$= \frac{1}{3}\pi \times 144 \times 12 \times 5$

$= 240\pi \text{ cm}^3$ Ans

(ii) $\frac{\text{Volume of Cone in Sum 7}}{\text{Volume of Cone in Sum 8}} = \text{Ratio}$

$\frac{500\pi \text{ cm}^3}{\frac{240\pi \text{ cm}^3}{12}} = \text{Ratio}$

5 : 12 Ans

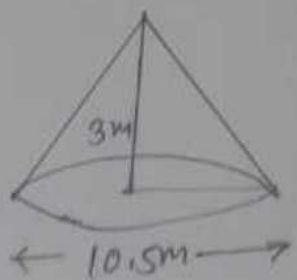
9 Sum 13.7 : A heap of wheat is in the form of a Cone whose diameter is 10.5 m and height is 3 m. Find its volume. The heap is to be covered by canvas to protect it from rain. find the area of the canvas required.

Sol : diameter = 10.5 m

radius = $\frac{10.5}{2}$ m 5.25 m

radius = 5.25 m

height = 3 m



volume of Cone = $\frac{1}{3}\pi r^2 h$

$= \frac{1}{3} \times \frac{22}{7} \times (5.25)^2 \times 3$

$= \frac{1}{3} \times \frac{22}{7_1} \times 5.25 \times 5.25 \times 3 \ m^3$ (0.75)

$= 22 \times 0.75 \times 5.25 \ m^3$

$= 86.625 m^3$

$l = \sqrt{r^2 + h^2}$

$= \sqrt{(5.25)^2 + (3)^2}$

$= \sqrt{27.5625 + 9} = \sqrt{36.5625}$

$= 6.05$ m

	6.05
6	36.5625
	36
120	56
	00
125	5625
	5625
	x

Curved surface area of Cone = $\pi r l$

$= \frac{22}{7_1} \times 5.25 \times 6.05$ (0.75)

$= 22 \times 0.75 \times 6.05 \ m^2$

$= 99.825 m^2$ Ans