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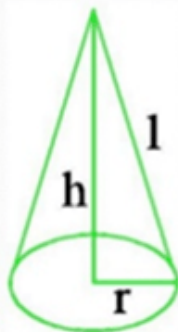
NCERT Class 9 Solutions: Surface Areas and Volumes (Chapter 13) Exercise 13.7 – Part 1

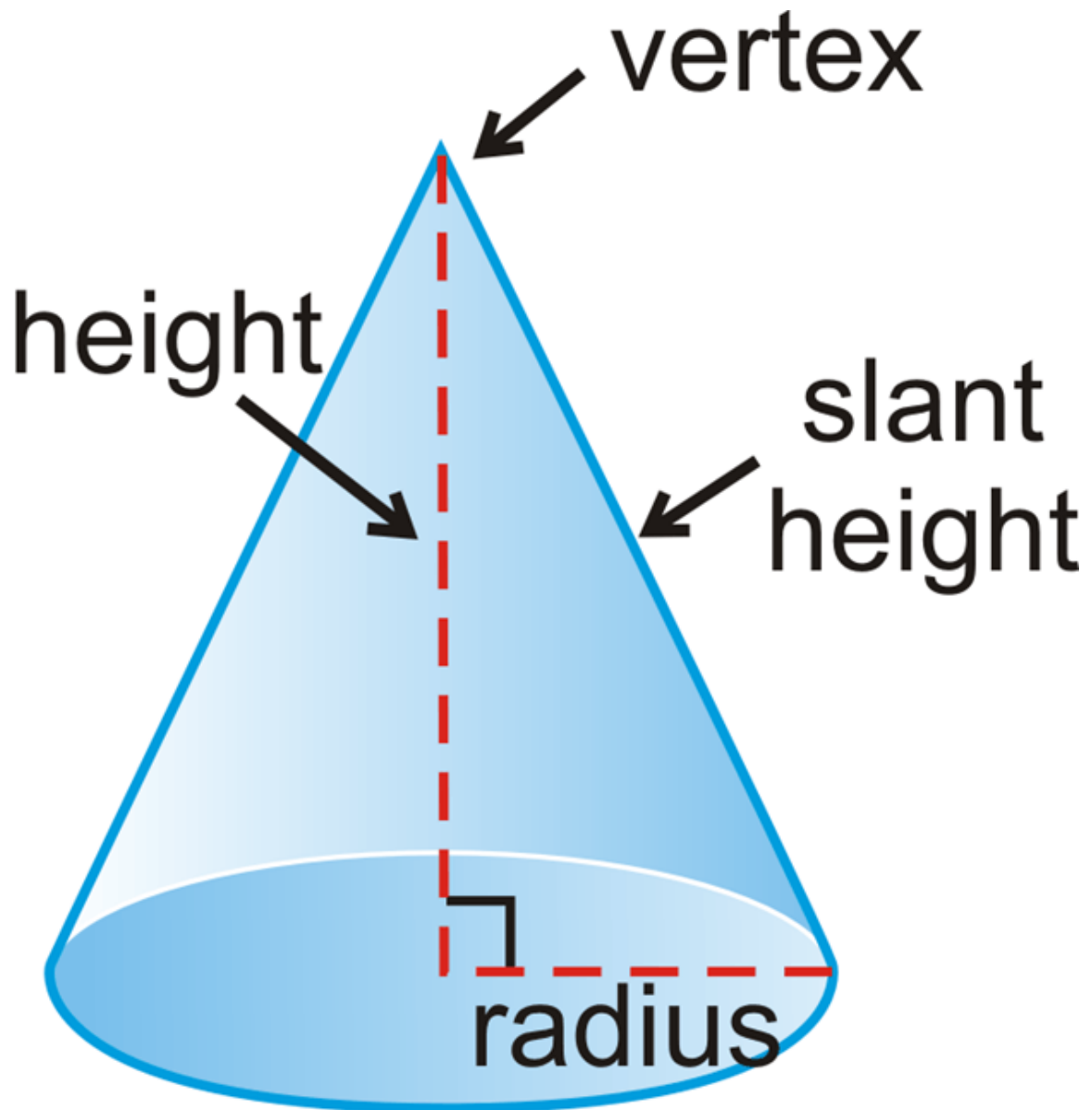
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- Area of base = πr^2

$$\therefore \text{volume of a cone} = \frac{1}{3} \times \pi r^2 \times h$$

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





By the Pythagoras theorem, $(\text{Slant height})^2 = (\text{Radius})^2 + (\text{Height})^2$

Q-1 Find the volume of the right circular cone with

1. Radius 6 cm , height 7 cm
2. Radius 3.5 cm , height 12 cm

Solution:

1. Radius $(r) = 6\text{ cm}$, Height $(h) = 7\text{ cm}$, Therefore, volume of the cone

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

$$3. = \left(\frac{1}{3} \times \frac{22}{7} \times 6 \times 6 \times 7 \right) \text{ cm}^3$$

$$4. = 264 \text{ cm}^3$$

5. Radius $(r) = 3.5\text{ cm}$, Height $(h) = 12\text{ cm}$, Volume of the cone

$$6. = \frac{1}{3} \pi r^2 h$$

$$7. = \left(\frac{1}{3} \times \frac{22}{7} \times 3.5 \times 3.5 \times 12 \right) cm^3$$

$$8. = 154 cm^3$$

Q-2 Find the capacity in liters of a conical vessel with

1. Radius 7 cm , slant height 25 cm

2. Height 12 cm , slant height 13 cm

Solution:

Radius $(r) = 7\text{ cm}$, Slant height $(l) = 25\text{ cm}$, Consider the height of the conical vessel . Then by applying Pythagoras theorem,

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

$$\Rightarrow h = \sqrt{25^2 - 7^2}$$

$$\Rightarrow h = \sqrt{625 - 49}$$

$$\Rightarrow h = \sqrt{576}$$

$$\Rightarrow h = 24\text{ cm}$$

Now, volume of the cone

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

$$= \left(\frac{1}{3} \times \frac{22}{7} \times 7 \times 7 \times 24 \right) cm^3$$

$$= 1232 cm^3$$

Therefore, capacity of the vessel $= \left(\frac{1232}{1000} \right) l = 1.232l$

Height $(h) = 12\text{ cm}$, Slant height $(l) = 13\text{ cm}$, Consider the radius of the conical vessel . Again, using Pythagoras theorem,

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

$$r = \sqrt{13^2 - 12^2}$$

$$r = \sqrt{169 - 144}$$

$$r = \sqrt{25}$$

$$r = 5\text{ cm}$$

Volume of the cone

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

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

$$= \left(\frac{2200}{7} \right) cm^3$$

Therefore, capacity of the vessel $= \left(\frac{2200}{7000} \right) l = \frac{11}{35} l$, $1l = 1000cm^3$