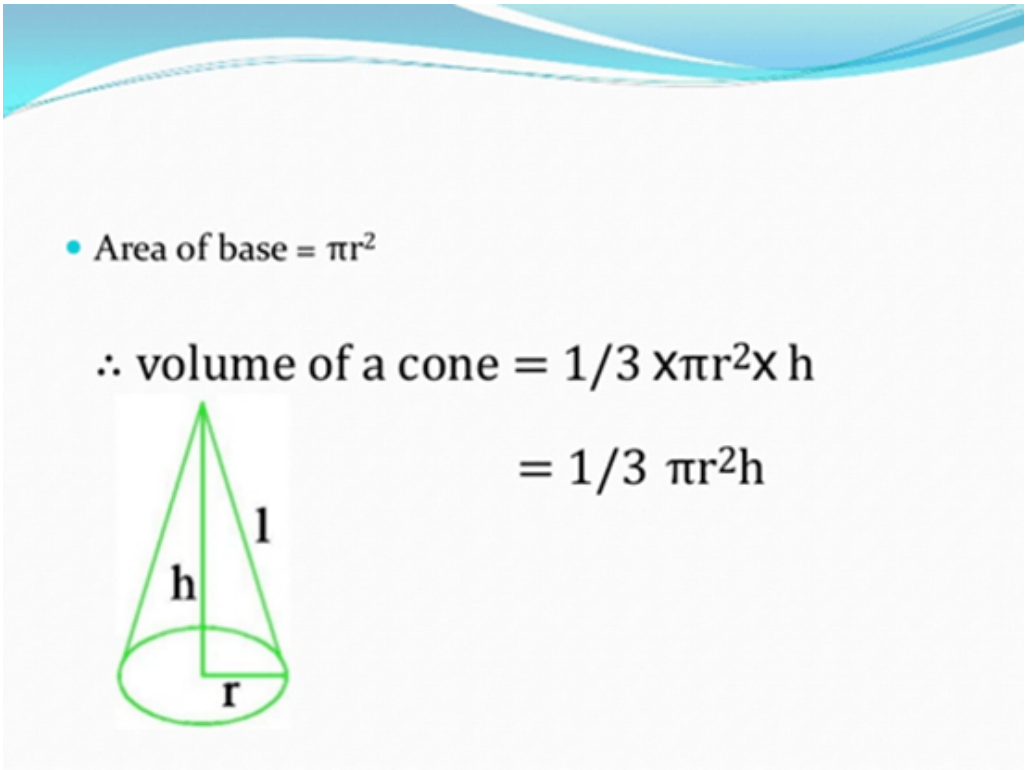
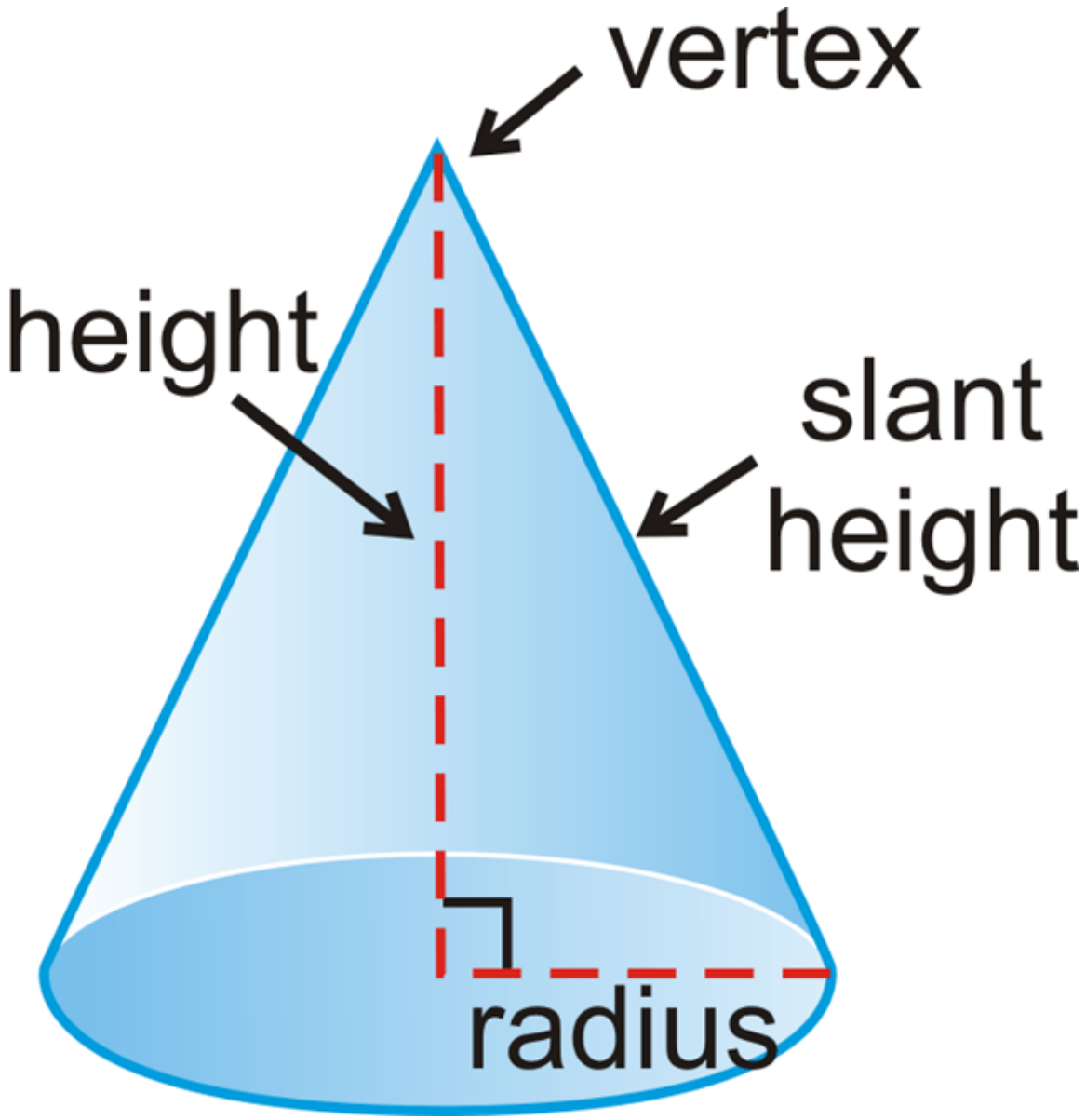
NCERT Class 9 Solutions: Surface Areas and Volumes (Chapter 13) Exercise 13.7 – Part 1





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 $(r) = 6\,cm$, Height $(h) = 7\,cm$, Therefore, volume of the cone
2. $= \frac{1}{3}\pi r^2 h$
3. $= \left(\frac{1}{3} \times \frac{22}{7} \times 6 \times 6 \times 7\right) cm^3$
4. $= 264 cm^3$
5. Radius $(r) = 3.5\,cm$, Height $(h) = 12\,cm$, 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 $(r) = 7\ cm$, Slant height $(l) = 25\ cm$, Consider the height of the conical vessel . Then by applying Pythagoras theorem,

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

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

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

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

$$\Rightarrow h = 24\ cm$$

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 $= \left(\frac{1232}{1000}\right) l = 1.232 l$

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

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

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

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

$$r = \sqrt{25}$$

$$r = 5\ cm$$

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