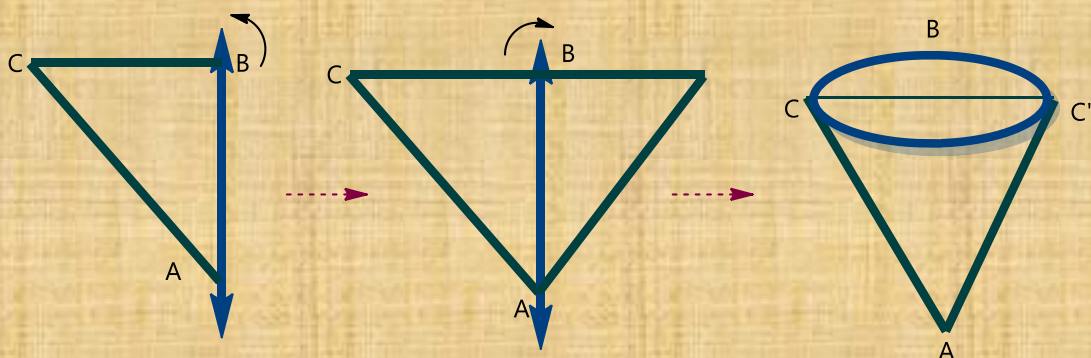


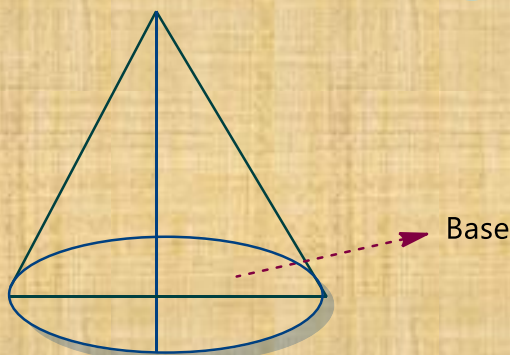
CHAPTER 13

Surface areas and Volumes

Cone:



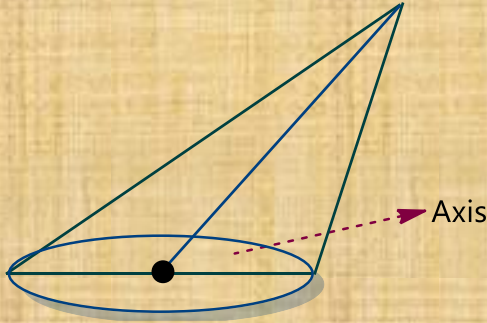
If we rotate a right-angled triangle about one of the sides, containing right angle, then we will get a solid called a right circular cone.



Note:

- If the base of cone is not circular then we cannot call it as a right circular cone.

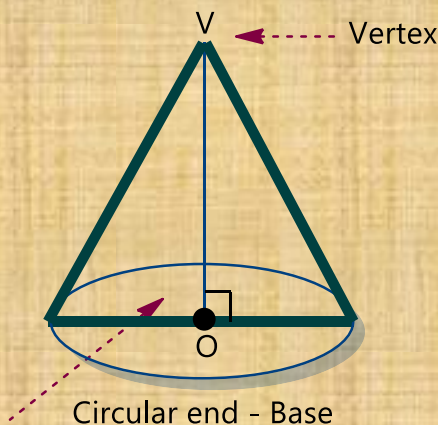
- If the axes of the cone is not a right angle to the base then we cannot call it as a right circular cone.



Cone:

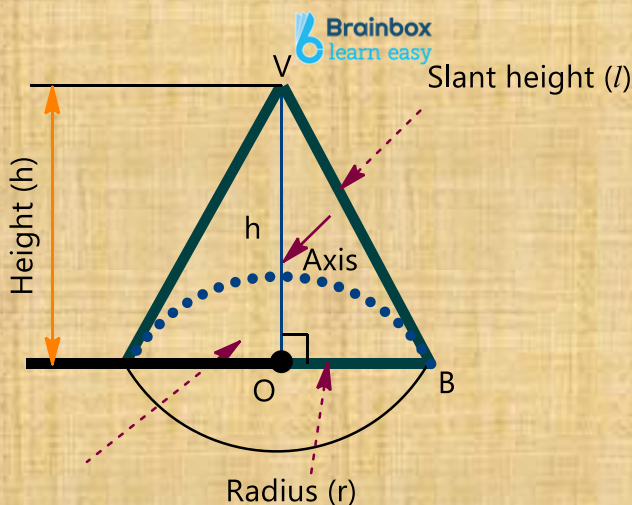
A right circular cone is a solid, which has plane end called the base, which is circular in slope.

It has a corner, (a point V) called vertex at the farthest base. A curved surface connects the vertex and the circular edge. This is called the lateral surface of the cone.



If 'V' is the vertex and 'O' is the centre of the base, then 'VO' is called the axis of the cone and its length is called the height of

the cone. VB is called a slant side of the cone and its length is called the slant height of the cone.



In right circular cone, $VO \perp OC$ and $\triangle VOB$ is a right-angled triangle.

$$\therefore VB^2 = VO^2 + OB^2 \text{ (Pythagoras theorem)}$$

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

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

Curved surface area, total surface area and volume of cone:

- The curved surface area of the cone $= \pi r l$. We can verify the above formula for the curved surface area.
- Total surface area of the cone = (Lateral surface area) + (Area of the base)

$$= \pi r l + \pi r^2$$

Hence, total surface area of the cone = $\pi r(l + r)$

- Volume of a cone is given by $(V) = \frac{1}{3}\pi r^2 h$

