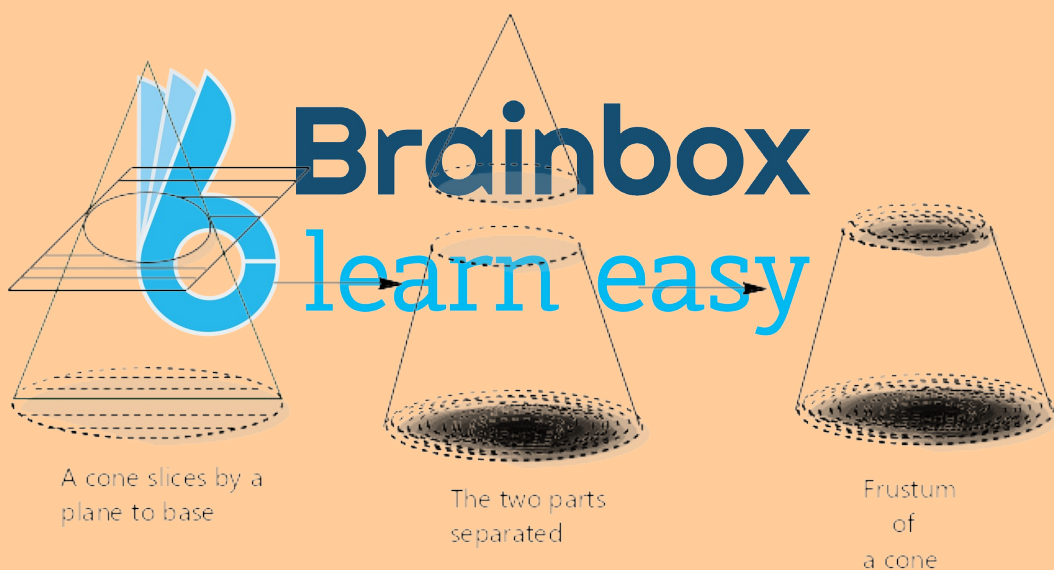


CHAPTER 10

Surface Area and Volume

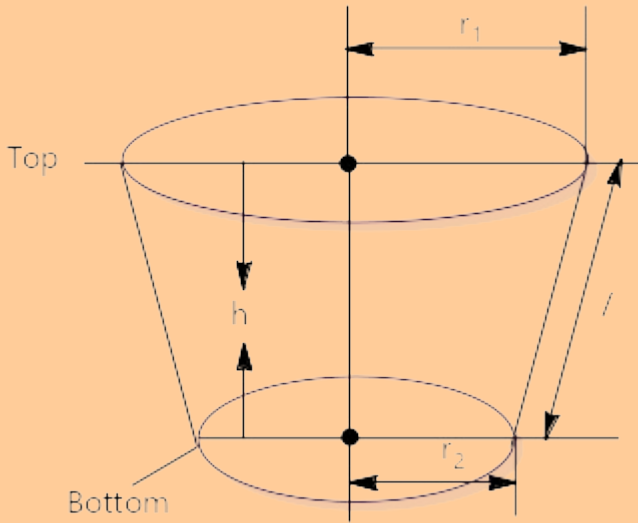
Frustum of a cone:

If a right circular cone is cut – off by a plane parallel to the base, then the portion left after removing the part, which contains the vertex of the cone is called the frustum of a cone as in the given figure.



In other words, a frustum is the portion of a solid figure that lies between one or two parallel planes cutting it. Each plane section is the base of the frustum. The height of the frustum is the perpendicular distance between the planes of the two bases.

Here, we study about frustum of a cone.



Let,

h = Height

l = Slant height

r_1, r_2 = radii of the ends ($r_1 > r_2$) are the frustum of a cone. Then,

• Volume of the frustum of the cone = $\frac{1}{3} \pi h (r_1^2 + r_2^2 + r_1 r_2)$

• Curved surface area of the frustum of the cone = $\pi (r_1 + r_2) l$

$$\text{Where, } l = \sqrt{h^2 + (r_1 - r_2)^2}$$

• Total surface area of the frustum of the cone =

$$\pi (r_1 + r_2) l + \pi r_1^2 + \pi r_2^2, \text{ where } l = \sqrt{h^2 + (r_1 - r_2)^2}$$

1. Area of the ,eta; sheet used for making the bucket
 = Outer (or inner) curved surface area + Area of bottom
 = $\pi l (r_1 + r_2) + \pi r_2^2$
2. Volume of the frustum = $\frac{h}{3} [A_1 + A_2 + \sqrt{A_1 A_2}]$ Where
 A_1 & A_2 are areas of circular bases of the frustum.

