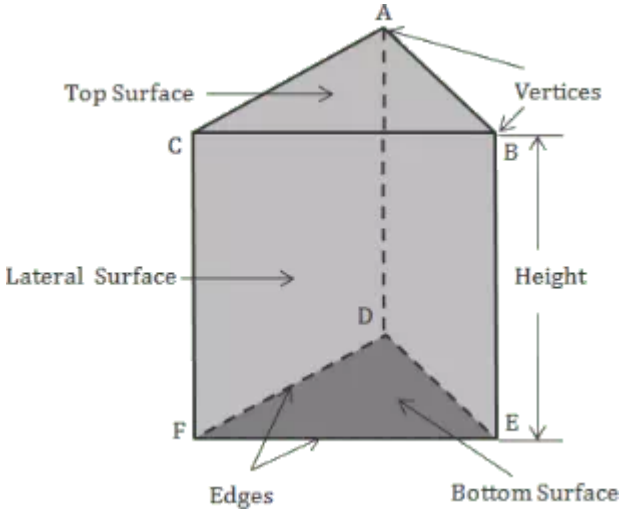
Surface Areas and Volumes of Solids (3D Solids)

Right Prism

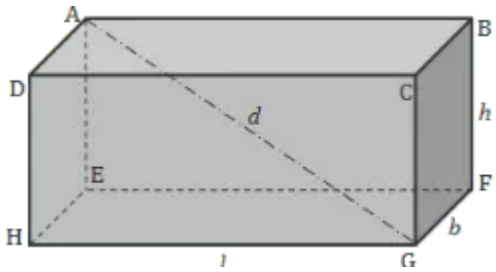


Right Prism

Lateral Surface Area $(\mathrm{L.S.A.}) = \text{Perimeter of base} \times \text{height}$ Total Surface Area $(\mathrm{T.S.A.}) = \mathrm{L.S.A.} + 2 \times \text{Area of base}$

Volume $(\mathrm{V}) = \text{Area of base} \times \text{height}$

Cuboid



Cuboid

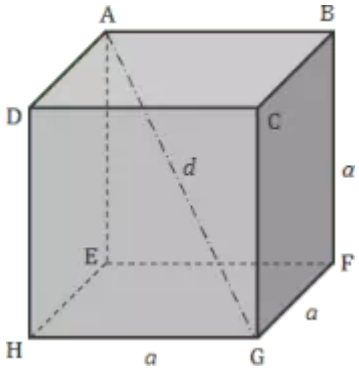
$$L.S.A. = 2(lh + bh)$$

$$\mathrm{T.S.A.} = 2(\mathrm{lh} + \mathrm{bh} + \mathrm{lb})$$

$$\mathrm{Volume(V)} = \mathrm{lbh}$$

$$\text{Body diagonal}\left(\mathrm{d}\right) = \sqrt{l^2 + b^2 + h^2}$$

Cube



Cube

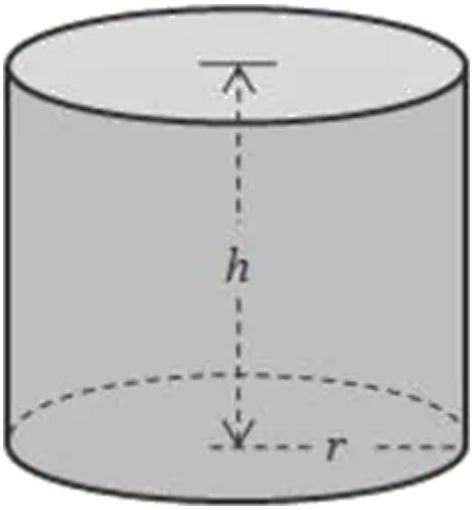
$$\text{L. S. A.} = 4a^2$$

$$\text{T. S. A.} = 6a^2$$

$$\text{Volume } (\text{V}) = a^3$$

$$\text{Body diagonal } (\text{d}) = \sqrt[a]{3}$$

Cylinder



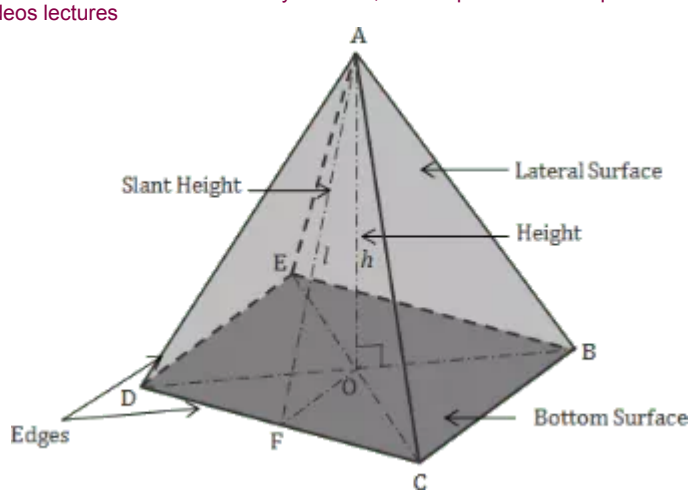
Cylinder

$$\text{Curved Surface Area (C. S. A.)} = 2\pi rh$$

$$\text{T. S. A.} = 2\pi rh + 2\pi r^2$$

$$\text{Volume } (\text{V}) = \pi r^2 h$$

Right Pyramid



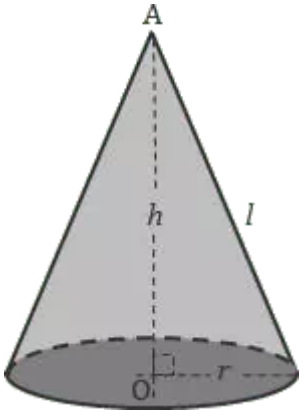
Right Pyramid

$$\text{L. S. A} = \frac{1}{2} \times \text{Perimeter of Base} \times \text{Slant Height}$$

$$\text{T. S. A.} = \text{L. S. A.} + \text{Area of base}$$

$$\text{Volume (V)} = \frac{1}{2} \times \text{Area of bas} \times \text{Height}$$

Cone



Cone

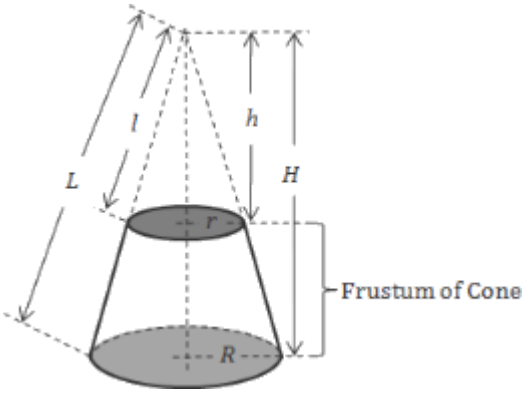
$$\text{C. S. A.} = \pi rl$$

$$T.S.A. = \pi rl + \pi r2$$

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

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

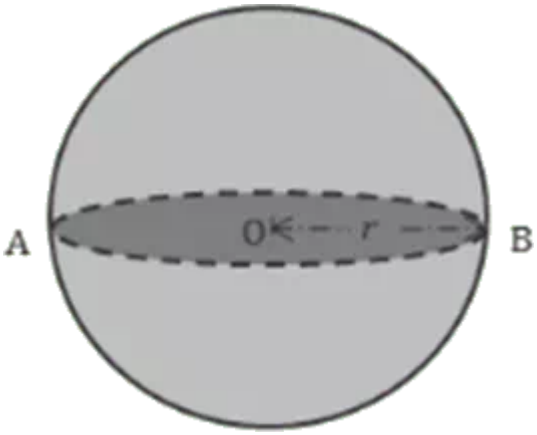
Frustum of a Cone



Frustum of a Cone

$$\frac{\text{Volume of the Original Cone}}{\text{Volume of the removed Cone}} = \frac{V}{v} = \left(\frac{R}{r}\right)^3 = \left(\frac{H}{h}\right)^3 = \left(\frac{L}{l}\right)^3$$

Sphere



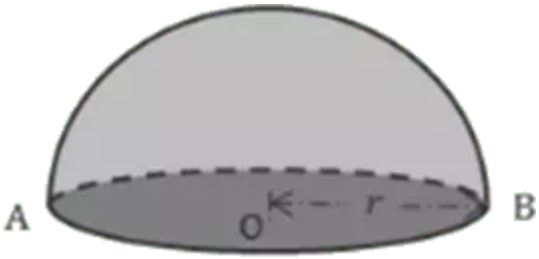
Sphere

$$C.S.A. = 4\pi r2$$

$$T.S.A. = 4\pi r2$$

$$Volume\ (V) = \frac{4}{3}\pi r^3$$

Hemisphere



Hemisphere

$$C.S.A. = 2\pi r^2$$

$$T.S.A. = 3\pi r^2$$

$$Volume\ (V) = \frac{2}{3}\pi r^3$$