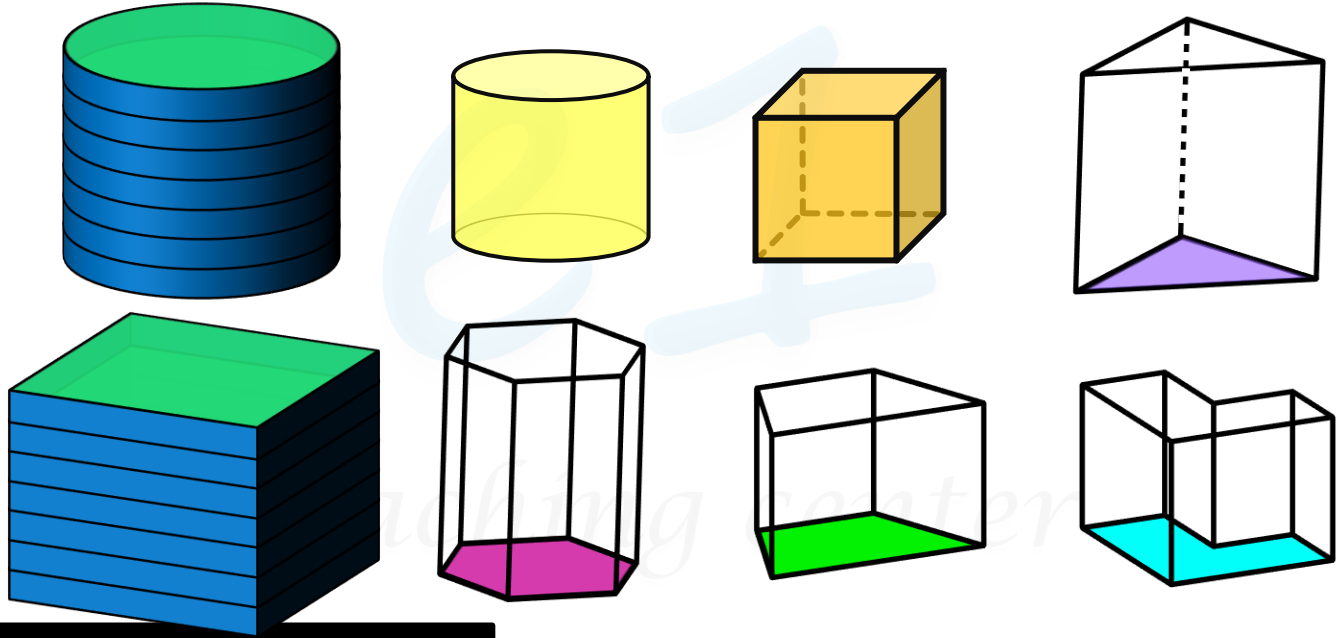


# Understanding all the 3D shapes

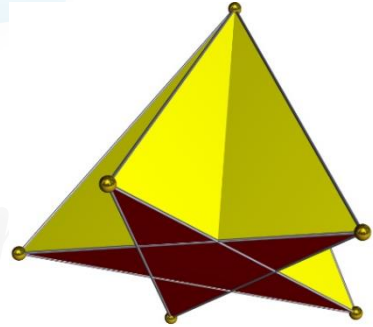
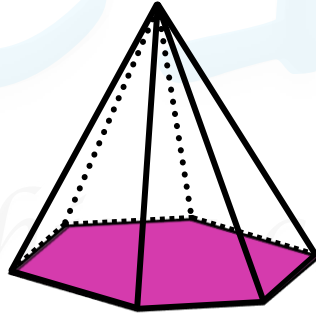
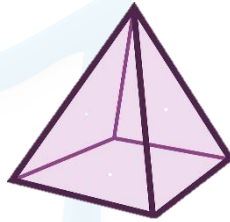
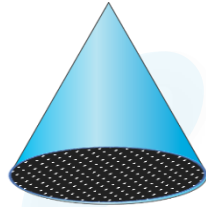
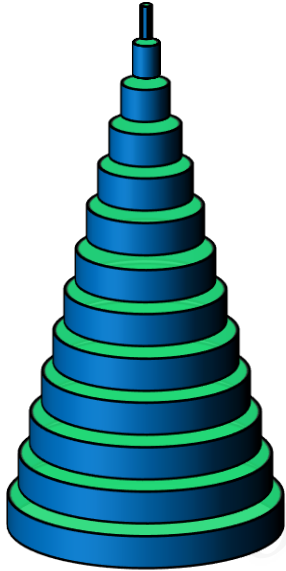
- **How are they formed?**
- **Animation, nets**
- **Generalised formulas**
- **Specific formulas**

*coaching center*

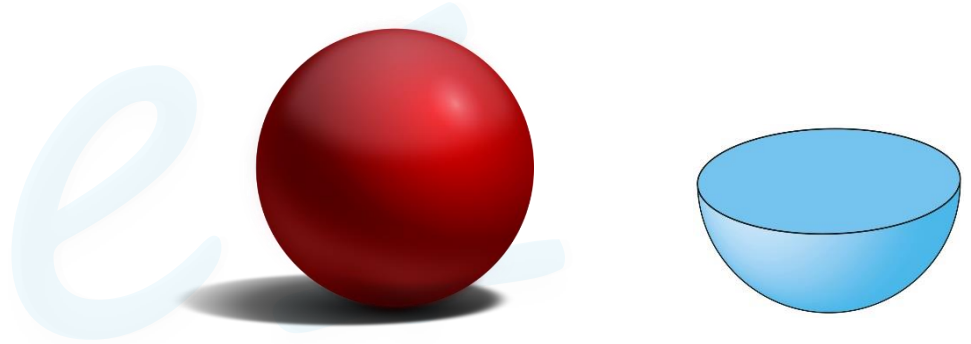
# Prisms (परिज्म):



# Pyramids (पिरामिड्स):

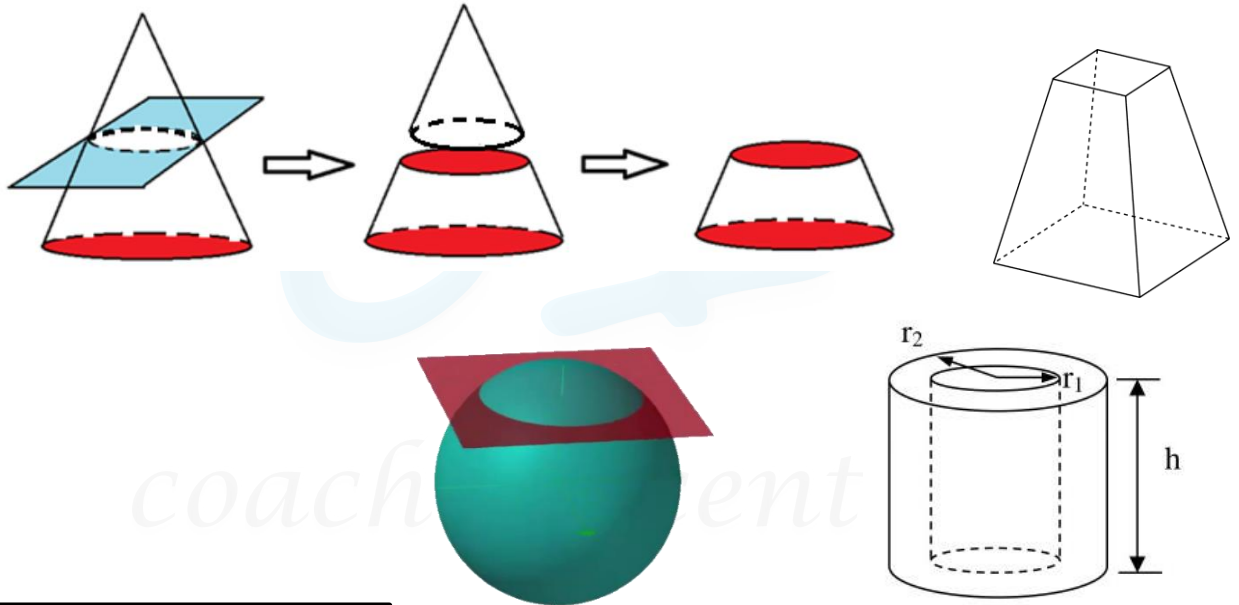


# Sphere (गोला):

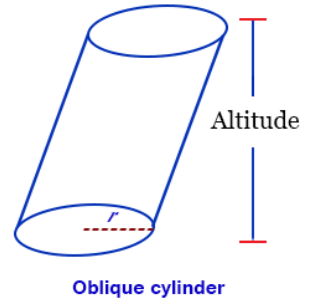
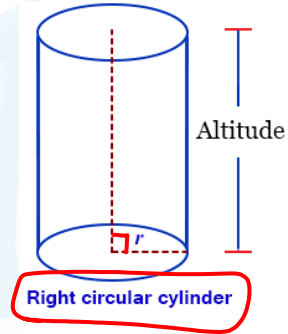
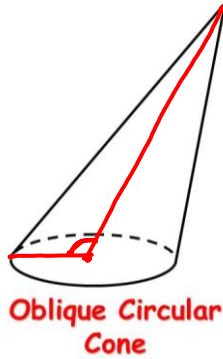
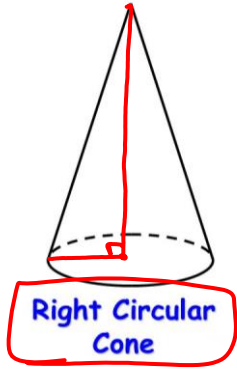


*coaching center*

# Other shapes (बाकि आकृतियाँ):



# Oblique shapes (गैर-समकोण आकृति):

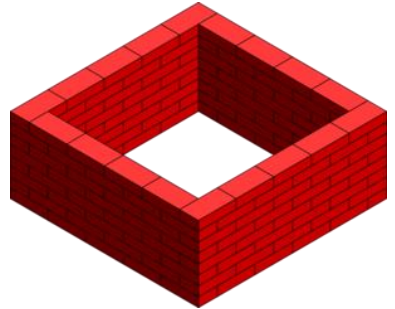
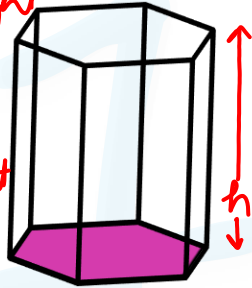


*coaching center*

# Generalised formulas for Prisms:

Volume = area of base  $\times$  height  
(आयतन)

Lateral Surface area = Perimeter of base  $\times$  height  
(पार्श्व पृष्ठीय क्षेत्रफल)



Total Surface area = L.S.A + area of top & bottom  
(कुल पृष्ठीय क्षेत्रफल)

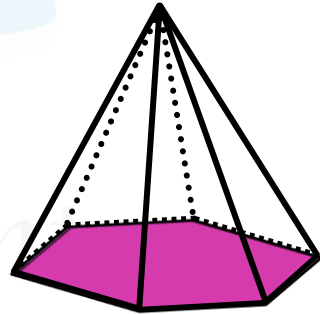
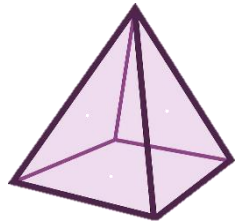
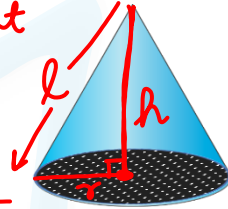


# Generalised formulas for Pyramids:

Volume =  $\frac{1}{3} \times \text{ar. of base} \times \text{height}$   
(आयतन)

L.S.A =  $\frac{1}{2} \times \text{Peri. of base} \times \text{slant height}$   
(पा.पृ.क्ष.)

T.S.A = L.S.A + area of base  
(कु.पृ.क्ष.)





# Cuboid (घनाभ):



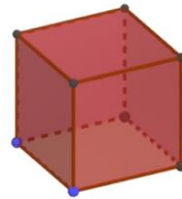
Volume =  $l \times b \times h$   
(आयतन)

Lateral Surface area =  $2(l+b) \times h$   
(पार्श्व पृष्ठीय क्षेत्रफल)

Total Surface area =  $2(l+b) \times h + 2lb$   
(कुल पृष्ठीय क्षेत्रफल) =  $2(lb + bh + hl) \checkmark$

Diagonal  
(विकर्ण)

$$= \sqrt{l^2 + b^2 + h^2}$$



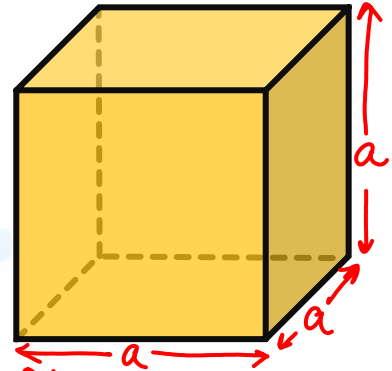
# Cube (घन):

Volume =  $a^3$   
(आयतन)

Lateral Surface area =  $4a^2$   
(पार्श्व पृष्ठीय क्षेत्रफल)

Total Surface area =  $6a^2$   
(कुल पृष्ठीय क्षेत्रफल)

Diagonal =  $\sqrt{a^2+a^2+a^2} = \sqrt{3}a$   
(विकर्ण)



\* Cuboid with equal  
l, b & h,  $l=b=h=a$

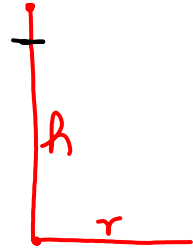
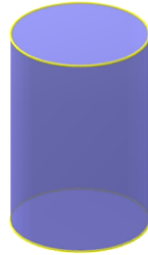
# Cylinder (बेलन):



Volume (आयतन) =  $\pi r^2 \times h$

Curved Surface area (वक्र पृष्ठीय क्षेत्रफल) =  $2\pi r \times h$

Total Surface area (कुल पृष्ठीय क्षेत्रफल) =  $2\pi r h + 2\pi r^2$   
=  $2\pi r (r + h)$



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# Cone (शंकु):

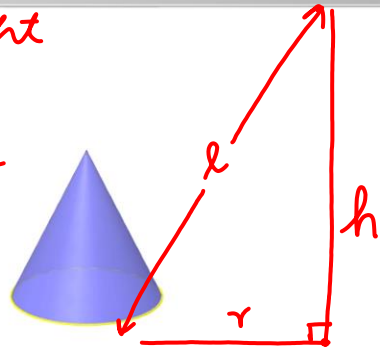


Volume (आयतन) =  $\frac{1}{3} \times \pi r^2 \times h$

Curved Surface area (वक्र पृष्ठीय क्षेत्रफल) =  $\frac{1}{2} \times \cancel{2\pi r} \times l = \pi r l$

Total Surface area (कुल पृष्ठीय क्षेत्रफल) =  $\pi r l + \pi r^2$   
=  $\pi r (r + l)$

Slant height  
↓



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

coaching

# Tetrahedron (चतुष्फलक):

① RAT (AGD) :

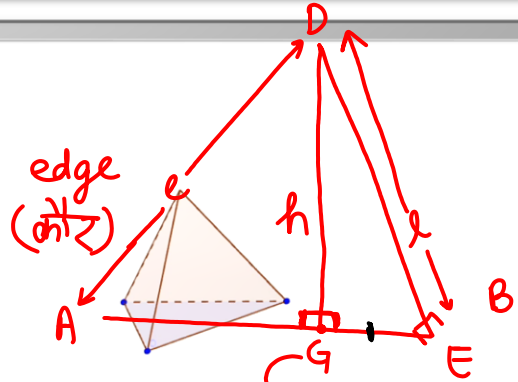
$$AD^2 = AG^2 + DG^2$$

② RAT (DGE) :

$$DE^2 = DG^2 + GE^2$$

$$V = \frac{1}{3} \times \frac{\sqrt{3}}{4} a^2 \times h$$

$$LSA = \frac{1}{2} \times 3a \times l$$



$$\begin{aligned} AG \rightarrow R &= \frac{a}{\sqrt{3}} \\ GE \rightarrow r &= \frac{a}{2\sqrt{3}} \end{aligned} \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} \begin{array}{l} \text{Centroid} \\ \text{(केंद्रक)} \end{array}$$

# Square pyramid (वर्ग पिरामिड):

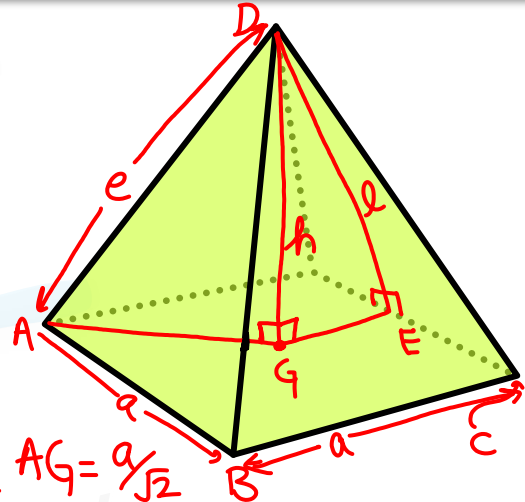
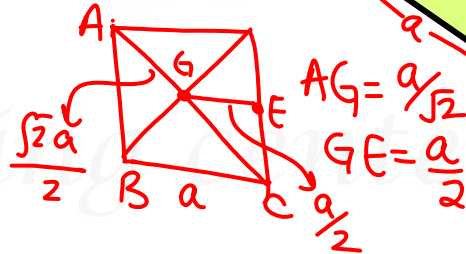
$$\text{RAT (AGD): } AD^2 = AG^2 + GD^2$$

$$\text{RAT (DGE): } DE^2 = DG^2 + GE^2$$

$$V = \frac{1}{3} \times a^2 \times h$$

$$LSA = \frac{1}{2} \times 4a \times l$$

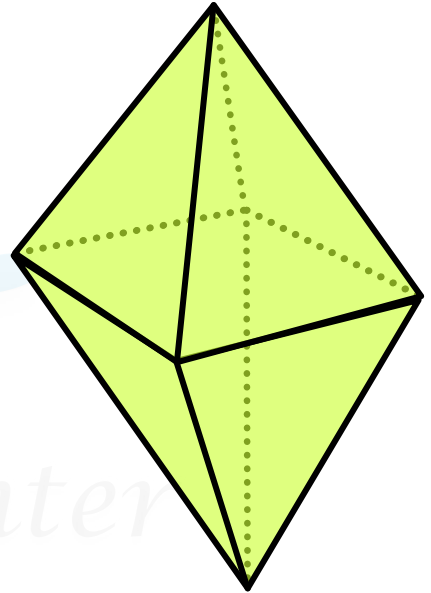
$$TSA = LS \cdot A + \square$$



# Octahedron (अष्टफलक):

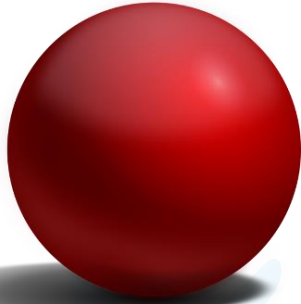
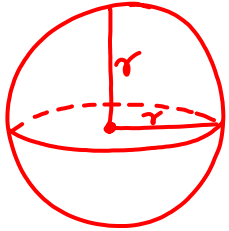
8 face

\* Made by joining 2 square based pyramids



coaching center

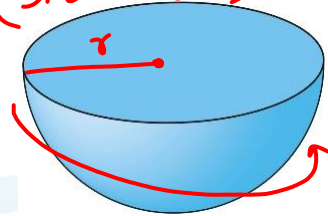
# Sphere & hemi-sphere (गोला और अर्ध-गोला):



$$\text{Volume} = \frac{4}{3} \pi r^3$$

$$\text{SA/T.S.A} = 4\pi r^2 \left\{ \begin{array}{l} \text{Ar of} \\ 4 \text{ circles} \end{array} \right\}$$

Hemi sphere :  
(अर्ध गोला)



$$\text{Volume} = \frac{2}{3} \pi r^3$$

$$\text{C.S.A} = 2\pi r^2$$

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



# Torus (टोरस):

Surf

$$2\pi r \times 2\pi R$$

$$\pi r^2 \times 2\pi R$$

