

CDS 1 2025

LIVE

MATHS

MENSURATION 3D

CLASS 2

NAVJYOTI SIR

SSBCrack
CLAMS

Crack
EXAMS



14 Nov 2024 Live Classes Schedule

- 8:00AM --- 14 NOVEMBER 2024 DAILY CURRENT AFFAIRS --- RUBY MA'AM
- 9:00AM --- 14 NOVEMBER 2024 DAILY DEFENCE UPDATES --- DIVYANSHU SIR

SSB INTERVIEW LIVE CLASSES

- 9:30AM --- OVERVIEW OF GPE & PRACTICE SESSION --- ANURADHA MA'AM

NDA 1 2025 LIVE CLASSES

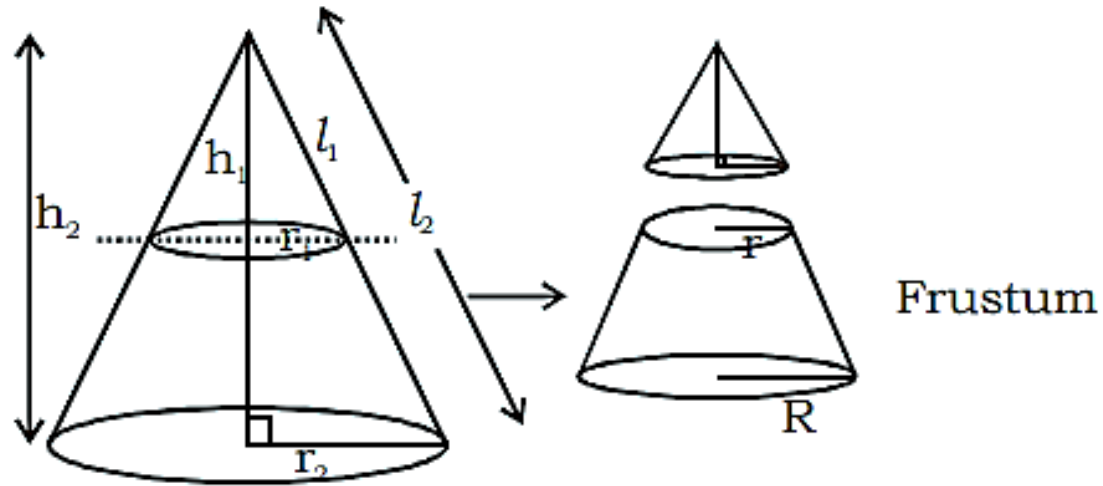
- 11:30AM --- GK - MODERN HISTORY - CLASS 5 --- RUBY MA'AM
- 1:00PM --- CHEMISTRY MCQ - CLASS 7 --- SHIVANGI MA'AM
- 4:00PM --- MATHS - SEQUENCE & SERIES - CLASS 2 --- NAVJYOTI SIR
- 5:30PM --- ENGLISH - SENTENCE COMPLETION - CLASS 1 --- ANURADHA MA'AM

CDS 1 2025 LIVE CLASSES

- 11:30AM --- GK - MODERN HISTORY - CLASS 5 --- RUBY MA'AM
- 1:00PM --- CHEMISTRY MCQ - CLASS 7 --- SHIVANGI MA'AM
- 5:30PM --- ENGLISH - SENTENCE COMPLETION - CLASS 1 --- ANURADHA MA'AM
- ✓ 7:00PM --- MATHS - MENSURATION 3D - CLASS 2 --- NAVJYOTI SIR



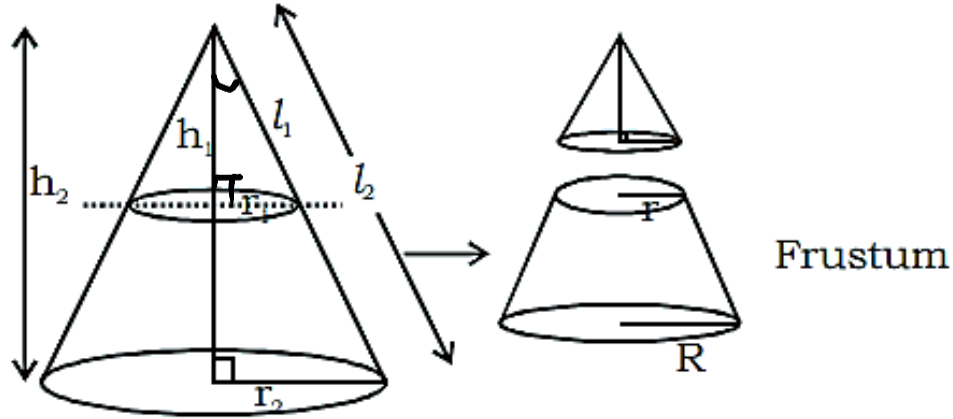
CUTTING OF CONE



$$\frac{r_1}{r_2} = \frac{h_1}{h_2} = \frac{l_1}{l_2} \quad (\text{Triangles are similar})$$

✓ ✓ ✓

CUTTING OF CONE

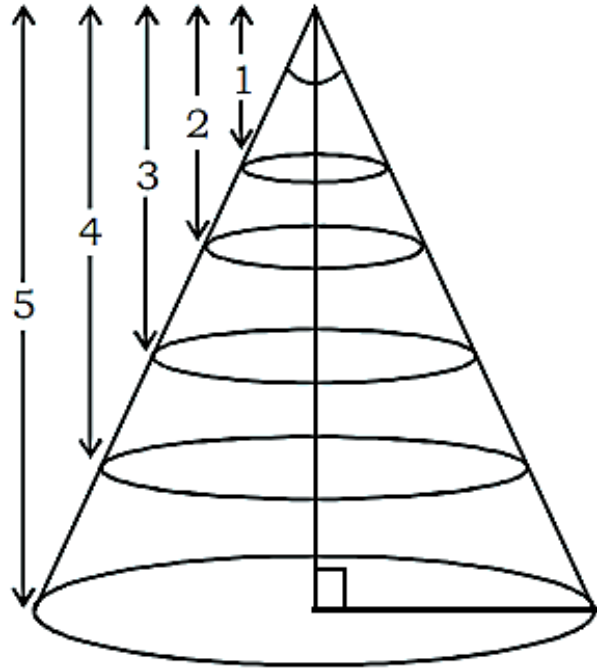


$$\frac{r_1}{r_2} = \frac{h_1}{h_2} = \frac{l_1}{l_2}$$

$$\frac{\text{small cone CSA}}{\text{Big cone CSA}} = \frac{\pi r_1 l_1}{\pi r_2 l_2} = \left(\frac{r_1}{r_2}\right)^2 = \left(\frac{l_1}{l_2}\right)^2 = \left(\frac{h_1}{h_2}\right)^2$$

$$\frac{\text{small cone volume}}{\text{Big cone volume}} = \frac{\frac{1}{3} \pi r_1^2 h_1}{\frac{1}{3} \pi r_2^2 h_2} = \left(\frac{r_1}{r_2}\right)^3 = \left(\frac{l_1}{l_2}\right)^3 = \left(\frac{h_1}{h_2}\right)^3$$

CUTTING OF CONE



CSA of 5 parts \Rightarrow

$$1^2 : 2^2 - 1^2 : 3^2 - 2^2 : 4^2 - 3^2 : 5^2 - 4^2$$

$$\mathbf{1 : 3 : 5 : 7 : 9} \quad \text{(Ratio)}$$

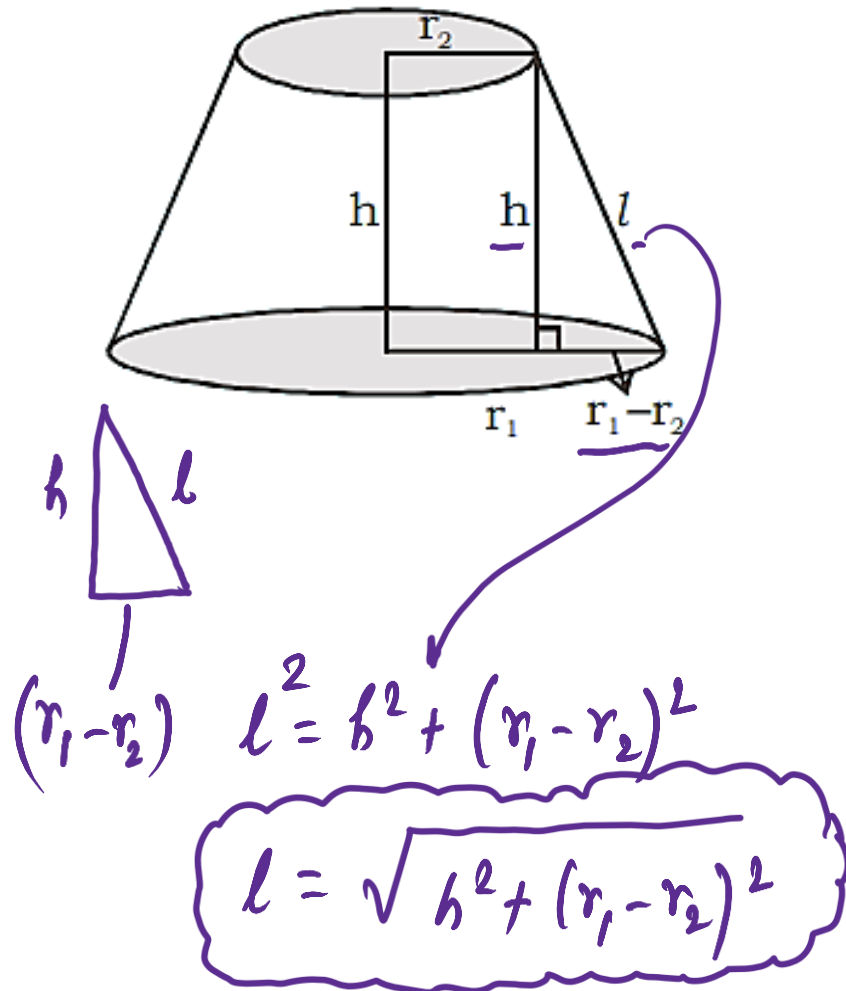
Volume of 5 parts \Rightarrow

$$1^3 : 2^3 - 1^3 : 3^3 - 2^3 : 4^3 - 3^3 : 5^3 - 4^3$$

$$\mathbf{1 : 7 : 19 : 37 : 61} \quad \text{(Ratio)}$$

FRUSTUM OF A CONE

→ lower part of what is obtained when a cone is cut, parallel to base.

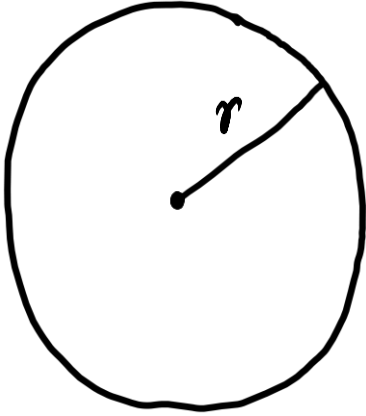


$$CSA = \pi (r_1 + r_2) l$$

$$TSA = \pi (r_1 + r_2) l + \pi r_1^2 + \pi r_2^2$$

$$Volume = \frac{1}{3} \pi h (r_1^2 + r_2^2 + r_1 r_2)$$

SPHERE



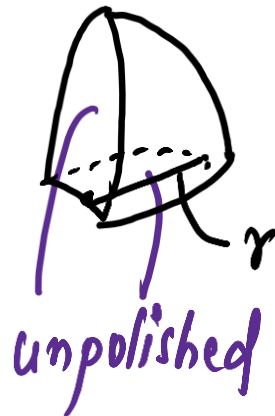
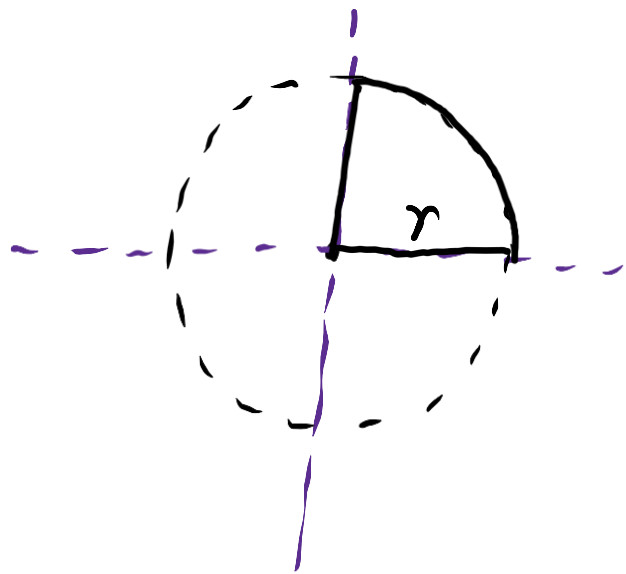
$$\text{Surface area} = \frac{4\pi r^2}{\text{(curved surface area) / (TSA)}}$$

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

QUESTION

A spherical ball was first polished and then it was cut into 4 similar pieces. What is the ratio of the polished area to the non-polished area ?

$$\text{polished area} = \text{area of sphere} = 4\pi r^2$$

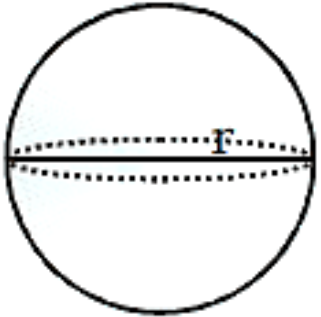


$$\begin{aligned}\text{unpolished area} &= \left(2 \times \frac{\pi r^2}{2}\right) \times 4 \\ &= 4\pi r^2\end{aligned}$$

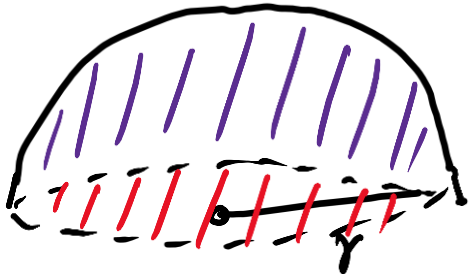
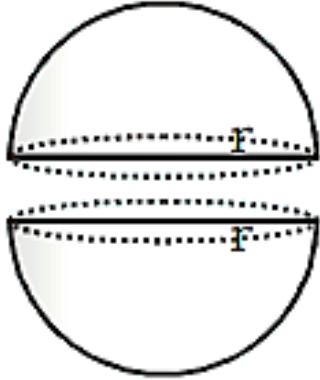
$$\text{Ratio} = \frac{4\pi r^2}{4\pi r^2} = 1:1$$

HEMISPHERE

Sphere



Hemi-Sphere

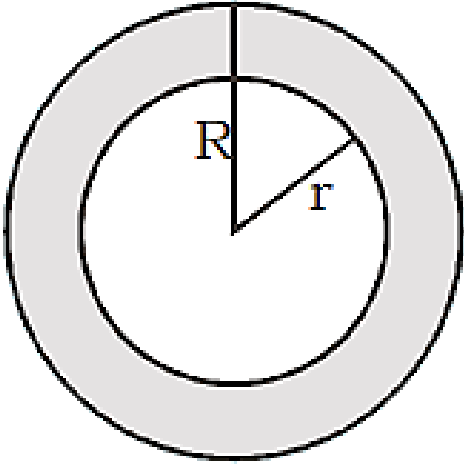


$$CSA = \frac{4\pi r^2}{2} = 2\pi r^2$$

$$TSA = 2\pi r^2 + \pi r^2 = 3\pi r^2$$

$$Volume = \frac{1}{2} \left(\frac{4}{3} \pi r^3 \right) = \frac{2}{3} \pi r^3$$

HOLLOW SPHERE



$$\begin{aligned} \text{Volume} &= \frac{4}{3} \pi R^3 - \frac{4}{3} \pi r^3 \\ &= \frac{4}{3} \pi (R^3 - r^3) \end{aligned}$$

QUESTION

The external and internal diameters of an aluminium shell are 13 cm and 10 cm respectively. Find the volume of aluminum shell ?

$$2R = 13 \quad \Rightarrow \quad R = \frac{13}{2} = 6.5 \text{ cm}$$

$$2r = 10 \quad \Rightarrow \quad r = \underline{5 \text{ cm}}$$

$$\text{Volume} = \pi (R^3 - r^3) = \underbrace{(3.142)} \left((6.5)^3 - (5)^3 \right)$$

PRISM

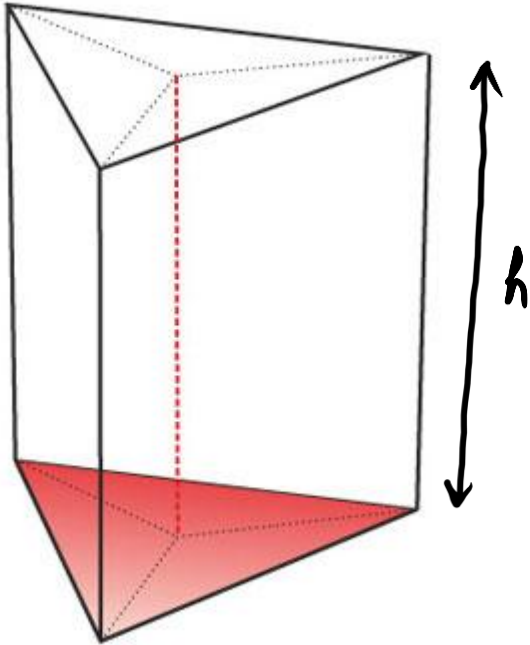
A prism is a solid figure with identical ends, flat faces and same cross section all along its length.

Base and Top of the prism is same. ✓

Surface of prism is lateral and not curved

Cube, cuboid are prism but cylinder is not prism.

TRIANGULAR PRISM



$$LSA = \text{perimeter of base} \times h$$

$$TSA = CSA + \text{area of top and bottom triangles}$$

$$\text{Volume} = \text{area of base} \times \text{height}$$

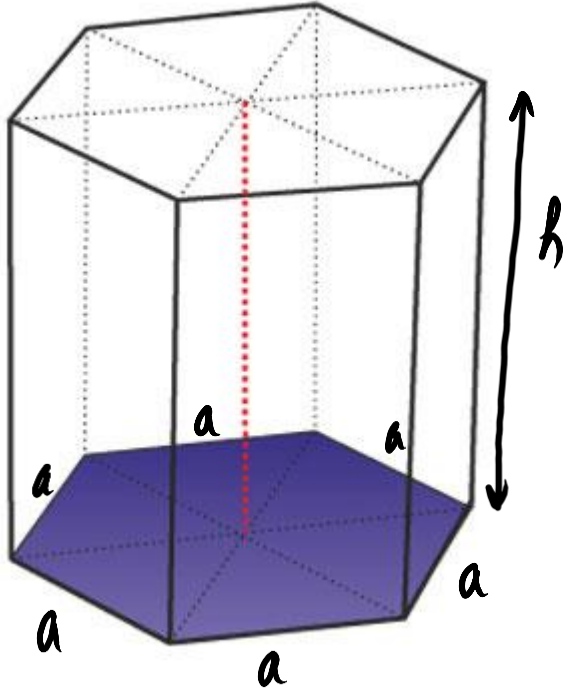
GENERAL FORMULA FOR ANY PRISM

$$LSA = \text{perimeter of base} \times \text{height}$$

$$TSA = CSA + 2 \times \text{area of base}$$

$$\text{Volume} = \text{area of base} \times \underline{\text{height}}$$

HEXAGONAL PRISM



$$LSA = 6ah$$

$$TSA = 6ah + 2 \times 3\sqrt{3}a^2$$

$$= 6a(h + \sqrt{3}a)$$

$$\text{Volume} = \underline{3\sqrt{3}a^2} \times h$$

(area of regular hexagon = 6 x area of equilateral triangle)

$$= 6 \times \frac{\sqrt{3}}{4} a^2 = \underline{3\sqrt{3}a^2}$$

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