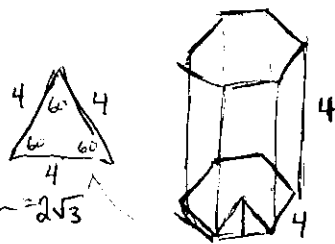


10. Every edge of a hexagonal prism is 4 inches. Find its volume and total surface area. Sketch a picture and label your answers with correct units.

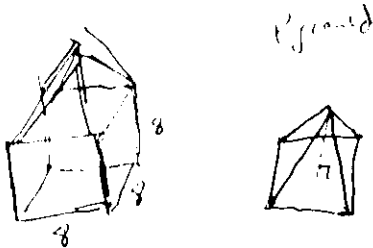


$$\begin{aligned}
 V &= B \cdot h \\
 &= \frac{1}{2}(A)(P) \cdot h \\
 &= \frac{1}{2}(2\sqrt{3})(24) \cdot 4 \\
 &= 24\sqrt{3} \cdot 4 \\
 &= 96\sqrt{3}
 \end{aligned}$$

$$\begin{aligned}
 \text{Area bases} &= (24\sqrt{3}) \cdot 2 = 48\sqrt{3} \\
 \text{Lateral S.A.} &= 4 \cdot 4 \cdot 6 = 96
 \end{aligned}$$

$$\begin{aligned}
 \text{T.S.A.} &= (96 + 48\sqrt{3}) \text{ in}^2 \\
 \text{Volume} &= 96\sqrt{3} \text{ in}^3
 \end{aligned}$$

11. A pyramid with height 3 cm is mounted on top of a cube with an 8 cm edge. Sketch a picture and find the total volume contained in the solid.

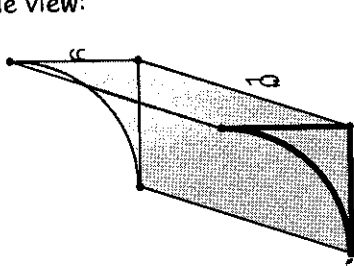


$$\begin{aligned}
 \text{Volume cube} &= 8^3 = 512 \text{ cm}^3 \\
 \text{Volume pyramid} &= \frac{1}{3} B \cdot h = \frac{1}{3} \cdot 64 \cdot 3 \\
 &= 64
 \end{aligned}$$

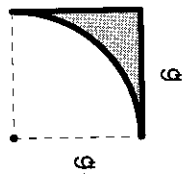
$$\text{Volume} = 576 \text{ cm}^3$$

12. Find the volume of steel needed to form the casting that is shown below.

Side view:



end view:
 $6 \cdot 6 = 36 = \text{Area square}$



$$\text{Area sector} = \frac{90}{360} (\pi r^2) = \frac{9}{36} (36\pi) = 9\pi$$

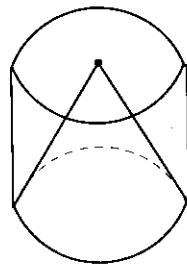
$$\text{A. square} - \text{Area circle sector} = 36 - 9\pi = \text{shaded}$$

$$\text{Volume} = (36 - 9\pi) \cdot 10 = (360 - 90\pi) \text{ units}^3$$

$$\text{Volume} = (360 - 90\pi) \text{ units}^3$$

13. Find the ratio of the volumes of this cone inscribed in a cylinder.

$$\frac{\text{cone}}{\text{cylinder}} = \frac{\frac{1}{3} B h}{B h} = \frac{1}{3}$$



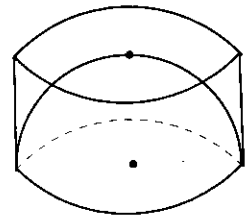
Ratio of Volume of the cone to

1:3

the volume of the cylinder =

14. Find the ratio of the volumes of this hemisphere inscribed in a cylinder.

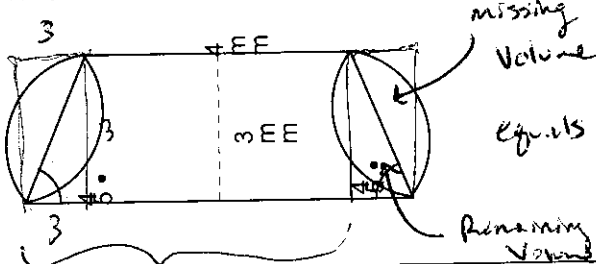
$$\frac{\text{hemisphere}}{\text{cylinder}} = \frac{\frac{2}{3} B h}{B h}$$



Ratio of the volume of the hemisphere to volume

of the cylinder = $\frac{2}{3}$

15. A cylinder with a diameter 3 mm is cut twice at a 45° angle as shown. Find the volume of this cylindrical solid.



$$\begin{aligned}
 V &= B h \\
 &= \pi (1.5)^2 (4 + 3) \\
 &= (2.25) 7 \pi \\
 &= 15.75 \pi \text{ mm}^3
 \end{aligned}$$

$$\text{Volume} = 15.75 \pi \text{ mm}^3$$