

Geometry
Volume of Spheres

Name: _____

Date: _____

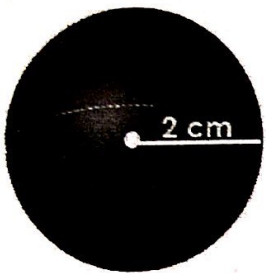
Volume of Spheres

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

- If you cut a sphere right down the middle you would create two congruent halves called hemispheres.

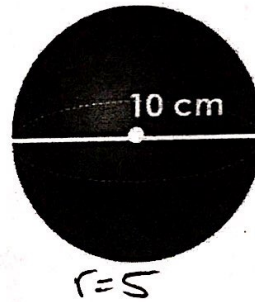
- A great circle is the cross section that is formed when you cut a sphere in half.

13. $V = 33.5 \text{ cm}^3$



$$V = \frac{4}{3} \pi 2^3$$

14. $V = 523.6 \text{ cm}^3$



$$V = \frac{4}{3} \pi 5^3$$

15. The circumference of a great circle is 25 inches. Find the volume. $V =$ _____



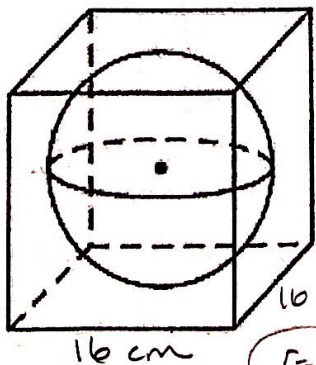
① $\frac{25 = 2\pi r}{2\pi}$

$r = 3.979$

② $V = \frac{4}{3} \pi (3.979)^3$

$= 263.9 \text{ m}^3$

16. A sphere is inscribed in a cube-shaped box as pictured below. To the nearest centimeter, what is the volume of the empty space in the box?



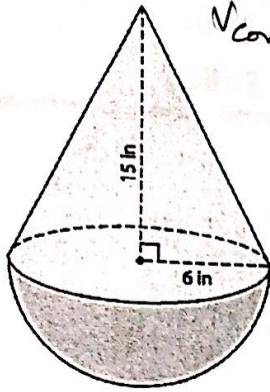
$$V_{\text{Box}} = 16 \cdot 16 \cdot 16 = 4096 \text{ cm}^3$$

$$V_{\text{sphere}} = \frac{4}{3} \pi 8^3 = 2144.7 \text{ cm}^3$$

$$V_{\text{empty space}} = 4096 - 2144.7 = 1951 \text{ cm}^3$$

Volume of Composite Figures

1.



$$\begin{aligned}
 V_{\text{cone}} &= \frac{1}{3} Bh \\
 &= \frac{1}{3} \pi r^2 h \\
 &= \frac{1}{3} \pi 6^2 \cdot 15 \\
 &= 565.49
 \end{aligned}$$

$$V_{\text{sphere}} = \frac{4}{3} \pi 6^3 = 904.78$$

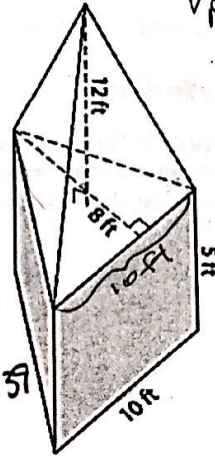
$$V_{\text{hemisphere}} = \frac{904.78}{2} = 452.39$$

$$V_{\text{cone}} = \underline{565.49 \text{ m}^3}$$

$$V_{\text{hemisphere}} = \underline{452.39 \text{ m}^3}$$

$$V_{\text{total}} = \underline{1017.88 \text{ m}^3}$$

2.



$$\begin{aligned}
 V_{\text{pyramid}} &= \frac{1}{3} Bh \\
 &= \frac{1}{3} \left(\frac{1}{2} bh \right) h \\
 &= \frac{1}{3} \left(\frac{1}{2} \cdot 10 \cdot 8 \right) 12 \\
 &= 160 \text{ ft}^3
 \end{aligned}$$

$$\begin{aligned}
 V_{\text{prism}} &= V = Bh \\
 &= \left(\frac{1}{2} bh \right) l \\
 &= \left(\frac{1}{2} \cdot 10 \cdot 8 \right) 5 \\
 &= 200 \text{ ft}^3
 \end{aligned}$$

$$V_{\text{prism}} = \underline{200 \text{ ft}^3}$$

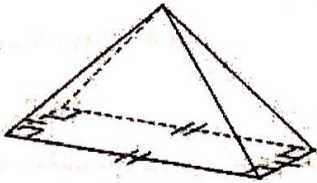
$$V_{\text{pyramid}} = \underline{160 \text{ ft}^3}$$

$$V_{\text{total}} = \underline{360 \text{ ft}^3}$$

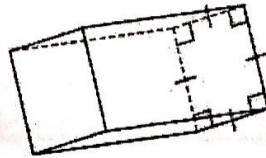
PUTTING IT ALL TOGETHER

Name each figure.

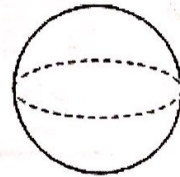
1.



2.

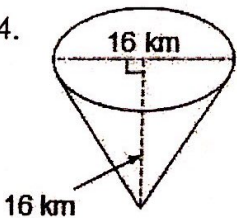


3.

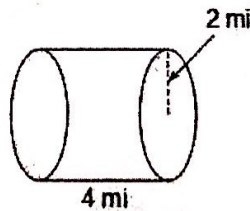


Find the volume of each figure. Round your answer to the nearest tenth, if necessary.

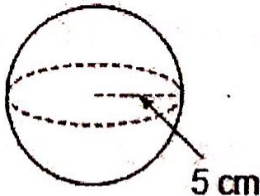
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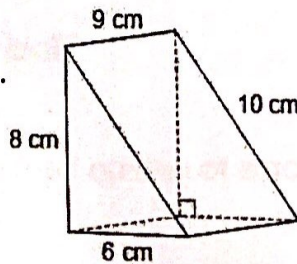
5.



6.



7.



8.

