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CC GEOMETRY

TROICI 11 days! ☺

LESSON #3: VOLUME OF SOLIDS

WORD	DEFINITION
SOLID FIGURES	3-D figures which have length, width & height
POLYHEDRON	3-D Figures made up of POLYGONS! (NO CIRCLES!)
VOLUME	The measure of the amount of solid space inside a solid figure
PRISM	A solid object w/ 2 identical ends and flat sides ex) rect. prism, triangular prism
PYRAMID	Base is a polygon with sides of triangles which meet @ the top (apex) ex) triangular prisms , pentagonal pyramids
FACE	polygons on the outside of a 3-D figure
EDGE	Line segment formed by the intersection of two faces
VERTEX	point where edges meet

Name: prism

Name: pyramid

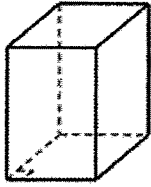
Name: cylinder

Name: cone

Name: sphere

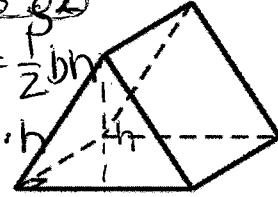
NOT polyhedrons!

Volume of a Prism: $V = Bh$
 $B = \frac{\text{Area of the base}}{\text{Area of the base}}$

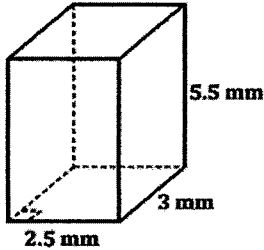


Rect. = $l \cdot w$
 $Vol = l \cdot w \cdot h$

~~square = $\frac{1}{2}bh$~~
 triangle = $\frac{1}{2}bh$
 volume = $\frac{1}{2}bh \cdot h$

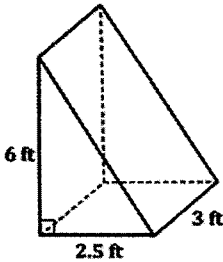


1. Determine the volume to the nearest *hundredth*.



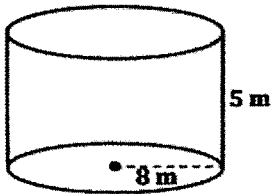
$V = lwh$
 $V = 2.5 \times 5.5 \times 3$
 $V = 41.25 \text{ mm}^3$

2. Determine the volume to the nearest *tenth*.



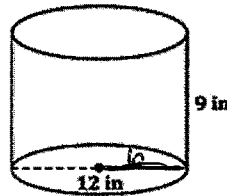
$V = Bh$
 $V = \frac{1}{2}bh \cdot h$
 $V = \frac{1}{2} \cdot 2.5 \cdot 6 \cdot 3$
 $V = 22.5 \text{ ft}^3$

3. Determine the volume in terms of π .



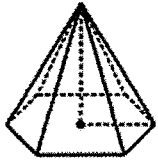
$V = Bh$
 $V = \pi r^2 \cdot h$
 $V = \pi (8)^2 \cdot 5$
 $V = 32\pi \text{ m}^3$

4. Determine the volume to the nearest *hundredth*.



$V = Bh$
 $V = \pi r^2 h$
 $V = \pi (6)^2 \cdot 9$
 $V = 324\pi \text{ in}^3$

Volume Pyramid: $V = \frac{1}{3} Bh$



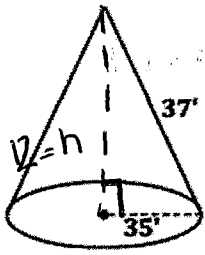
$B =$ Area of base!

Volume Cone: $= \frac{1}{3} \pi r^2 h$



$B =$ _____

5. Determine the volume to the nearest *tenth*.

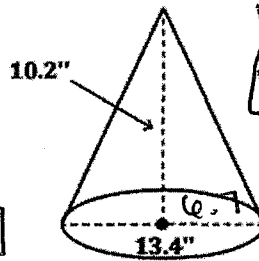


$$V = \frac{1}{3} \pi r^2 h$$

① Find h
 $35^2 + x^2 = 37^2$
 $x^2 = 144$
 $x = 12$

② Find volume
 $V = \frac{1}{3} \pi (35)^2 \cdot 12 = \boxed{15313.8}$

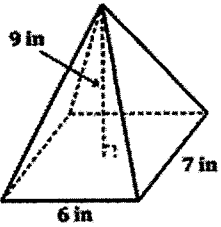
6. Determine the volume to the nearest *hundredth*.



$$V = \frac{1}{3} \pi (6.7)^2 \cdot 10.2$$

$$V = \boxed{479.49 \text{ in}^3}$$

7. Determine the volume to the nearest *unit*.



$$V = \frac{1}{3} Bh$$

$$V = \frac{1}{3} l \cdot w \cdot h$$

$$V = \frac{1}{3} \cdot 6 \cdot 7 \cdot 9$$

$$V = \boxed{126 \text{ in}^3}$$

8. The Great Pyramid of Giza has a volume of about 49,439,277 m³. The length of the edge of its square shaped base is 1924 meters. Approximate the height of the pyramid to the nearest meter.

$$V = \frac{1}{3} Bh$$

$$49439277 = \frac{1}{3} (1924)^2 \cdot h$$

$$49439277 = 1233925.333 h$$

$$h = 40.066 \rightarrow \boxed{40 \text{ m}}$$

9. The Great Pyramid of Giza was constructed as a regular pyramid with a square base. It was built with an approximate volume of 2,592,276 cubic meters and a height of 146.5 meters. What was the length of one side of its base, to the nearest meter?

$$V = \frac{1}{3} Bh$$

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

$$2592276 = \frac{1}{3} \cdot s^2 \cdot 146.5$$

$$2592276 = 48.8333 s^2$$

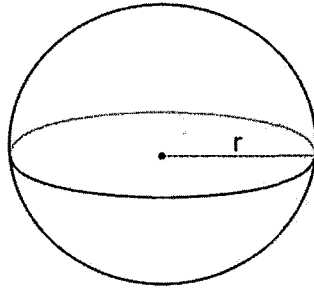
$$\frac{2592276}{48.83} = \frac{48.83 s^2}{48.83}$$

$$53087.77391 = s^2$$

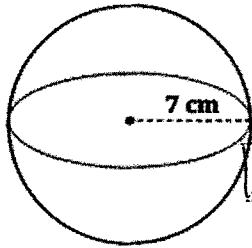
$$s = 230.41$$

$$\boxed{s = 230 \text{ m}}$$

Volume Sphere: $\frac{4}{3}\pi r^3$



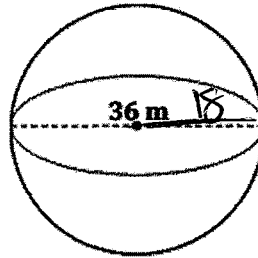
10. Determine the volume to the nearest hundredth.



$$V = \frac{4}{3}\pi(7)^3$$

$$V = 1436.76 \text{ cm}^3$$

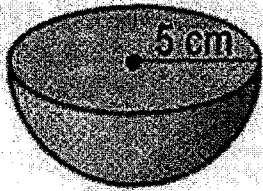
11. Determine the volume in terms of π .



$$V = \frac{4}{3}\pi(18)^3$$

$$V = 7776\pi$$

12. Determine the volume to the nearest tenth.

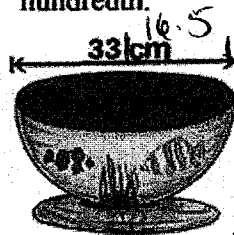


$$V = \frac{1}{2}\left(\frac{4}{3}\pi(5)^3\right)$$

$$V = \frac{1}{2}(523.598)$$

$$V = 261.8 \text{ cm}^3$$

13. Find the volume of the fish bowl to the nearest hundredth.



$$V = \frac{1}{2}\left(\frac{4}{3}\pi(16.5)^3\right)$$

$$V = \frac{1}{2}(18816.5642)$$

$$V = 9408.28 \text{ cm}^3$$

14. Find the volume of the cone to the nearest hundredth.

VOLUME cone + $\frac{1}{2}$ VOLUME sphere

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

$$\frac{1}{3} \pi (4)^2 \cdot 10 + \frac{1}{2} \left(\frac{4}{3} \pi (4)^3 \right)$$

$$167.5516 + 134.0412 = \boxed{301.59 \text{ cm}^3}$$

