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Date _____
Geometry

Calculating Volume Practice

1. A cylinder has a diameter of 10 inches and a height of 2.3 inches. What is the volume of this cylinder, to the nearest tenth of a cubic inch?

$$\begin{aligned}V &= \pi r^2 h \\V &= \pi (5)^2 (2.3) \\V &= 180.6 \text{ in}^3\end{aligned}$$

2. What is the volume of a rectangular prism whose length is 4 cm, width is 6 cm, and height is 5 cm?

$$\begin{aligned}V &= lwh \\V &= 4(6)(5) \\V &= 120 \text{ cm}^3\end{aligned}$$

3. What is the volume of a cube if each side of the cube measures 8 in?

$$\begin{aligned}V &= lwh \\V &= 8(8)(8) \\V &= 512 \text{ in}^3\end{aligned}$$

4. What is the volume of a cylinder whose height is 12 inches and whose diameter is 20 inches in terms of π ?

$$\begin{aligned}V &= \pi r^2 h \\V &= \pi (10)^2 (12) \\V &= 1200\pi \text{ in}^3\end{aligned}$$

5. Find the volume of a sphere that has a diameter of 12 in in terms of π .

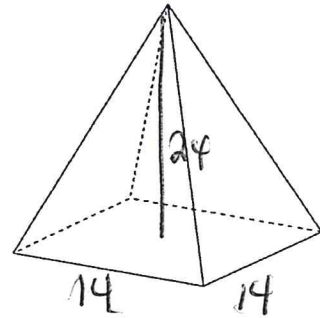
$$\begin{aligned}V &= \frac{4}{3}\pi r^3 \\V &= \frac{4}{3}\pi (6)^3 \\V &= 288\pi\end{aligned}$$

6. A regular pyramid has a square base with an edge length of 14 and an altitude of 24. Find its volume.

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

$$V = \frac{1}{3} (14)(14)(24)$$

$$V = 1568 \text{ units}^3$$



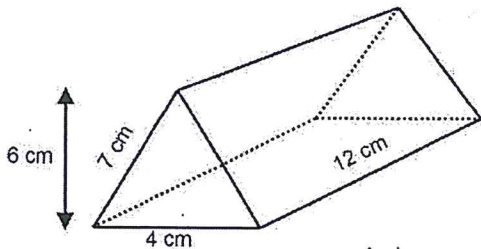
7. Find the volume of a cone with a height of 12 in and a diameter of 8 in rounded to the nearest hundredth.

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

$$V = \frac{1}{3} \pi (4)^2 (12)$$

$$V = 201.06$$

8. A pentagonal prism has an area of ~~12~~ square centimeters and a height of 12 centimeters. Explain why the pentagonal prism has the same volume of triangular prism shown below.

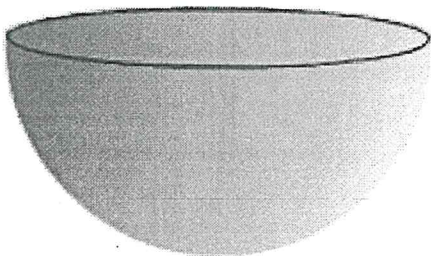


The area of the bases are the same and the heights are the same so the volumes are the same. Cavalieri's Principle.

$$\text{Area of the base} = \frac{1}{2}bh$$

$$= \frac{1}{2}(4)(6) = 12 \text{ cm}^2$$

9. Find the volume of the object below if the diameter is 18.2 meters. Round your answer to the nearest cubic meter.



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

$$V = \frac{1}{2} \left(\frac{4}{3} \pi (9.1)^3 \right)$$

$$V = 1578 \text{ m}^3$$

10. Find the volume of a pyramid with a base measuring 4 feet by 3 feet and a height of 12 feet.

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

$$V = 72 \text{ ft}^3$$

$$V = \frac{1}{3}(4)(3)(12)$$

11. Find the volume of a cone with a height of 4 cm and a radius of 3 cm rounded to the nearest hundredth.

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

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

$$V = 37.70$$

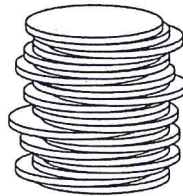
12. Find the volume of a cone with a height of 8 feet and a diameter of 10 feet in terms of π .

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

$$V = \frac{1}{3}\pi(5)^2(8)$$

$$V = \frac{200}{3}\pi$$

13. Two stacks of 23 quarters each are shown below. One stack forms a cylinder but the other stack does not form a cylinder.



Use Cavalieri's principle to explain why the volumes of these two stacks of quarters are equal.

The area of the bases are the same and the heights are the same so the volumes are the same.

