

Solid Volume Lab

Find exact volumes with π .

GRADE 8 • TEKS 8.7.A

8.7.A "solve problems involving the volume of cylinders, cones, and spheres;"

NAME _____

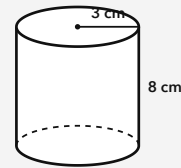
DATE _____

VOLUME RULES

Volume measures the space inside a solid. Use $V = \pi r^2 h$ for a cylinder, $V = \frac{1}{3}\pi r^2 h$ for a cone, and $V = \frac{4}{3}\pi r^3$ for a sphere. Leave π in your answer.

WORKED EXAMPLE

Find the volume of the cylinder shown.



$$1. V = \pi r^2 h$$

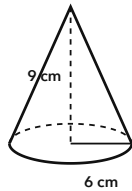
$$2. V = \pi(3)^2(8)$$

$$3. V = 72\pi \text{ cm}^3$$

Answer: $72\pi \text{ cm}^3$

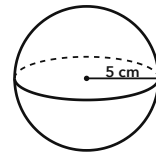
PRACTICE 4 problems

- 1** Find the volume of the cone shown.



ANSWER _____

- 2** Find the volume of the sphere shown.



ANSWER _____

- 3** A cylinder has a diameter of 10 cm and a height of 7 cm. Find its volume.

ANSWER _____

- 4** Find the total volume of a cone with radius 4 cm and height 12 cm and a sphere with radius 2 cm.

ANSWER _____

APPLY IT Show your work

- 1** A reusable water bottle is a cylinder with a diameter of 12 cm and a height of 10 cm. What is its capacity?

WORK SPACE

ANSWER _____

- 2** A snack cone is filled and topped with one spherical scoop. Both have radius 4 cm, and the cone is 9 cm high. What is the total volume of the snack?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A cylindrical popcorn tub has radius 6 cm and height 18 cm. Each cone-shaped serving has radius 3 cm and height 6 cm. How many full cone-shaped servings equal the tub's volume?

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Find the volume of the cone shown.	$108\pi \text{ cm}^3$
2	Find the volume of the sphere shown.	$500/3\pi \text{ cm}^3$
3	A cylinder has a diameter of 10 cm and a height of 7 cm. Find its volume.	$175\pi \text{ cm}^3$
4	Find the total volume of a cone with radius 4 cm and height 12 cm and a sphere with radius 2 cm.	$224/3\pi \text{ cm}^3$

PART 2 • APPLY IT

1. $360\pi \text{ cm}^3$ The radius is 6 cm. Use $V = \pi(6)^2(10)$.
2. $400/3\pi \text{ cm}^3$ Add the cone volume, $48\pi \text{ cm}^3$, and the sphere volume, $256/3\pi \text{ cm}^3$.

CHALLENGE

36 servings

Accept equivalent exact forms that keep π , such as $\pi(500/3)$. For the challenge, accept 36 only when the student divides the cylinder volume by one cone volume.