LESSON MAKER PRO

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;"

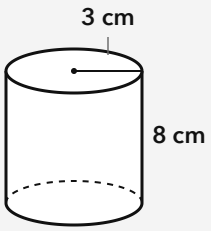
NAME _____ DATE _____

VOLUME RULES

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

WORKED EXAMPLE

Find the volume of the shown cylinder with radius 3 cm and height 8 cm.

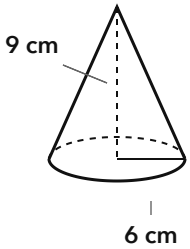


1. $V = \pi r^2 h$
2. $V = \pi(3)^2(8)$
3. $V = 72\pi$ cm^3

Answer: 72π cm^3

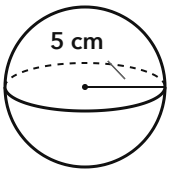
PRACTICE 4 problems

1 Find the volume of the shown cone with radius 6 cm and perpendicular height 9 cm.



ANSWER _____

2 Find the volume of the shown sphere with radius 5 cm.



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

ANSWER KEY

Solid Volume Lab

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the volume of the shown cone with radius 6 cm and perpendicular height 9 cm.	**108π cm^3**
2	Find the volume of the shown sphere with radius 5 cm.	**500/3π cm^3**
3	A cylinder has a diameter of 10 cm and a height of 7 cm. Find its volume.	**175π 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.	**224/3π cm^3**

PART 2 · APPLY IT

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

CHALLENGE

36 servings

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