LESSON MAKER PRO

Volume Formula Lab

Find exact volumes of cylinders, cones, and spheres.

GRADE 8 · 8.G.C.9

CCSS.Math.Content.8.G.C.9 "Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems."

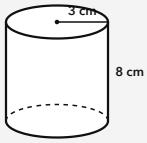
NAME _____ DATE _____

VOLUME FORMULAS

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. The radius is half the diameter. Leave pi in your answer unless the problem asks for a decimal.

WORKED EXAMPLE

Find the volume of the cylinder shown.

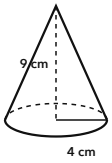


1. $V = \pi r^2 h$
2. $V = \pi(3)^2(8)$
3. $V = 72\pi \text{ cm}^3$

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

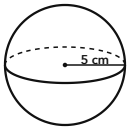
PRACTICE 6 problems

1 Find the volume of the cone shown.



ANSWER _____

2 Find the volume of the sphere shown.



ANSWER _____

3 A cylinder has a radius of 2 cm and a height of 7 cm. Find its volume.

ANSWER _____

4 A cone has a radius of 6 cm and a height of 5 cm. Find its volume.

ANSWER _____

5 A sphere has a diameter of 10 cm. Find its volume.

ANSWER _____

6 A cylinder has a diameter of 12 cm and a height of 4 cm. Find its volume.

ANSWER _____

APPLY IT Show your work

1 A gaming club orders cylindrical snack tubs with a radius of 7 cm and a height of 10 cm. What is the volume of one tub?

WORK SPACE

ANSWER _____

2 The art club makes a cone-shaped display for a school event. Its radius is 9 cm and its height is 14 cm. What is the display's volume?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A spherical tank has a radius of 6 cm. A cylindrical tank has a radius of 6 cm and a height of 12 cm. Which tank holds more, and how much more volume does it hold? Show calculations that support your answer.

WORK SPACE AND ANSWER

ANSWER KEY

Volume Formula Lab

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the volume of the cone shown.	**48pi cm^3**
2	Find the volume of the sphere shown.	**500pi/3 cm^3**
3	A cylinder has a radius of 2 cm and a height of 7 cm. Find its volume.	**28pi cm^3**
4	A cone has a radius of 6 cm and a height of 5 cm. Find its volume.	**60pi cm^3**
5	A sphere has a diameter of 10 cm. Find its volume.	**500pi/3 cm^3**
6	A cylinder has a diameter of 12 cm and a height of 4 cm. Find its volume.	**144pi cm^3**

PART 2 · APPLY IT

1. **490pi cm^3** Use V = pi r^{2}h. Substitute 7 for r and 10 for h: pi(7)^2(10) = 490pi.
2. **378pi cm^3** Use V = 1/3 pi r^{2}h. Substitute 9 for r and 14 for h: 1/3 pi(9)^2(14) = 378pi.

CHALLENGE

The cylinder holds more by 144pi cm^3. The sphere's volume is 288pi cm^3, and the cylinder's volume is 432pi cm^3.

Accept equivalent exact forms, such as (500/3)pi for 500pi/3. Students should use half of a given diameter as the radius.