LESSON MAKER PRO

Volume Mission

Find the space inside round solids.

GRADE 8 · 8.G.C

CCSS.Math.Content.8.G.C "Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres."

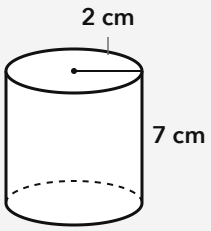
NAME _____ DATE _____

VOLUME RULES

The volume of a cylinder is $V = \pi r^2 h$. The volume of a cone is $V = (1/3)\pi r^2 h$, and the volume of a sphere is $V = (4/3)\pi r^3$. If you are given a diameter, divide it by 2 to find the radius.

WORKED EXAMPLE

The shown cylinder has radius 2 cm and height 7 cm. Find its volume in terms of π.

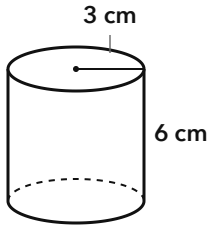


1. $V = \pi r^2 h$
2. $V = \pi(2)^2(7)$
3. $V = \pi(4)(7)$
4. $V = 28\pi$ cm^3

Answer: 28π cm^3

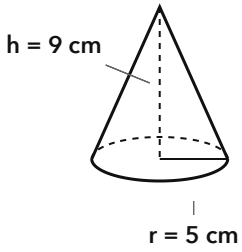
PRACTICE 6 problems

1 The shown cylinder has radius 3 cm and height 6 cm. Find its volume in terms of π.



ANSWER _____

2 The shown cone has radius 5 cm and perpendicular height 9 cm. Find its volume in terms of π.



ANSWER _____

3 A sphere has a radius of 6 cm. Find its volume in terms of π.

ANSWER _____

4 A cone has a radius of 8 cm and a height of 12 cm. Find its volume in terms of π.

ANSWER _____

5 A cylinder has a diameter of 16 cm and a height of 10 cm. Find its volume in terms of π.

ANSWER _____

6 A sphere has a diameter of 18 cm. Find its volume in terms of π.

ANSWER _____

APPLY IT Show your work

1 A gaming club stores dice in a cylindrical canister with a radius of 3 cm and a height of 15 cm. What is the canister's volume in terms of π?

WORK SPACE

ANSWER _____

2 A game designer creates a spherical soccer-ball model with a radius of 10 cm. What is the model's volume in terms of π?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A cone and a cylinder each have a radius of 9 cm and a height of 12 cm. How many full cone loads are needed to fill the cylinder? Explain using the volumes.

WORK SPACE AND ANSWER

ANSWER KEY

Volume Mission

GRADE 8 · 8.G.C

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	The shown cylinder has radius 3 cm and height 6 cm. Find its volume in terms of π.	**54π cm³**
2	The shown cone has radius 5 cm and perpendicular height 9 cm. Find its volume in terms of π.	**75π cm³**
3	A sphere has a radius of 6 cm. Find its volume in terms of π.	**288π cm³**
4	A cone has a radius of 8 cm and a height of 12 cm. Find its volume in terms of π.	**256π cm³**
5	A cylinder has a diameter of 16 cm and a height of 10 cm. Find its volume in terms of π.	**640π cm³**
6	A sphere has a diameter of 18 cm. Find its volume in terms of π.	**972π cm³**

PART 2 · APPLY IT

1. **135π cm³** Use $V = \pi r^2 h$. Substitute 3 for r and 15 for h: $\pi(3)^2(15) = 135\pi$.
2. **(4000/3)π cm³** Use $V = (4/3)\pi r^3$. Substitute 10 for r: $(4/3)\pi(10)^3 = (4000/3)\pi$.

CHALLENGE

3 full cone loads. The cylinder volume is 972π cm³, and the cone volume is 324π cm³. Since 972π ÷ 324π = 3, three cones fill the cylinder.

Accept equivalent exact forms, such as 135π cubic centimeters. Students should keep π in their answers and include cubic units.