

Cylinder Power

Find the volume inside right circular cylinders.

GRADE 7 • MA.7.GR.2.3

MA.7.GR.2.3 "Solve mathematical and real-world problems involving volume of right circular cylinders."

NAME _____

DATE _____

VOLUME RULE

Use $V = \pi r^2 h$ to find the volume of a right circular cylinder. Square the radius, multiply by the height, and include cubic units. If you are given the diameter, divide it by 2 to find the radius.

WORKED EXAMPLE

Find the volume of a right circular cylinder with a radius of 8 cm and a height of 11 cm.

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

2. $V = \pi(8)^2(11)$

3. $V = \pi(64)(11) = 704\pi$

Answer: $704\pi \text{ cm}^3$

PRACTICE 6 problems

- 1** Find the volume of a right circular cylinder with a radius of 3 cm and a height of 5 cm.

ANSWER _____

- 2** Find the volume of a right circular cylinder with a radius of 4 m and a height of 7 m.

ANSWER _____

- 3** A right circular cylinder has a diameter of 10 in. and a height of 6 in. Find its volume.

ANSWER _____

- 4** Find the volume of a right circular cylinder with a radius of $\frac{1}{2}$ ft and a height of 12 ft.

ANSWER _____

- 5** Find the volume of a right circular cylinder with a radius of 9 cm and a height of 2 cm.

ANSWER _____

- 6** A right circular cylinder has a volume of $169\pi \text{ cm}^3$ and a radius of 13 cm. Find its height.

ANSWER _____

APPLY IT Show your work

- 1** A makerspace is making a solid cylindrical phone stand from resin. The stand has a radius of 5 cm and a height of 14 cm. How much resin is needed?

WORK SPACE

ANSWER _____

- 2** A cylindrical sports drink jug has a diameter of 12 cm and a height of 25 cm. It is filled to $\frac{3}{5}$ of its full capacity. What volume of drink is in the jug?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A right circular cylinder has a volume of $500\pi \text{ cm}^3$ and a height of 20 cm. What is its diameter? Show your reasoning.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Find the volume of a right circular cylinder with a radius of 3 cm and a height of 5 cm.	$45\pi \text{ cm}^3$
2	Find the volume of a right circular cylinder with a radius of 4 m and a height of 7 m.	$112\pi \text{ m}^3$
3	A right circular cylinder has a diameter of 10 in. and a height of 6 in. Find its volume.	$150\pi \text{ in.}^3$
4	Find the volume of a right circular cylinder with a radius of $\frac{1}{2}$ ft and a height of 12 ft.	$3\pi \text{ ft}^3$
5	Find the volume of a right circular cylinder with a radius of 9 cm and a height of 2 cm.	$162\pi \text{ cm}^3$
6	A right circular cylinder has a volume of $169\pi \text{ cm}^3$ and a radius of 13 cm. Find its height.	1 cm

PART 2 • APPLY IT

- $350\pi \text{ cm}^3$** Use $V = \pi r^2 h$. Substitute 5 for the radius and 14 for the height: $\pi(5)^2(14) = 350\pi \text{ cm}^3$.
- $540\pi \text{ cm}^3$** The radius is 6 cm, so the full volume is $\pi(6)^2(25) = 900\pi \text{ cm}^3$. Find $\frac{3}{5}$ of 900π , which is $540\pi \text{ cm}^3$.

CHALLENGE

10 cm

Accept equivalent exact forms that use π , such as $45 \times \pi \text{ cm}^3$. For the challenge, students should find $r^2 = 25$, then $r = 5$ cm and diameter = 10 cm.