

Cylinder Volume Mission

Use base area and height to find volume.

GRADE 8 • TEKS 8.6.A

8.6.A "describe the volume formula $V = Bh$ of a cylinder in terms of its base area and its height;"

NAME _____

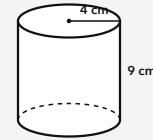
DATE _____

BASE AREA TIMES HEIGHT

For a cylinder, B is the area of one circular base, and h is the perpendicular height. Find B first, often with $B = \pi r^2$, then multiply B by h to find $V = Bh$.

WORKED EXAMPLE

Use the cylinder shown. Find its volume in terms of π .



$$1. B = \pi(4 \text{ cm})^2 = 16\pi \text{ cm}^2.$$

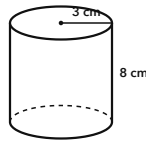
$$2. V = Bh.$$

$$3. V = (16\pi \text{ cm}^2)(9 \text{ cm}) = 144\pi \text{ cm}^3.$$

Answer: $144\pi \text{ cm}^3$

PRACTICE 6 problems

- 1** Use the cylinder shown. Find its volume in terms of π .



ANSWER _____

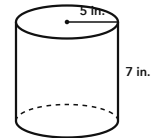
- 2** A cylinder has a base area of 25 cm^2 and a height of 6 cm. Find its volume.

ANSWER _____

- 3** A cylinder has a base area of $7/2 \text{ m}^2$ and a height of 12 m. Find its volume.

ANSWER _____

- 4** Use the cylinder shown. Find its volume in terms of π .



ANSWER _____

- 5** A cylinder has a diameter of 10 yd and a height of 11 yd. Find its volume in terms of π .

ANSWER _____

- 6** A cylinder has a volume of $126\pi \text{ ft}^3$ and a base area of $18\pi \text{ ft}^2$. Find its height.

ANSWER _____

APPLY IT Show your work

- 1** The music club stores rolled posters in a cylindrical tube. The tube has a base area of 28 cm^2 and a height of 15 cm. What is the volume of the tube?

WORK SPACE

ANSWER _____

- 2** A student makes a cylindrical pencil holder with a radius of 6 cm and a height of 13 cm. What is the holder's volume in terms of pi?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Container A has a base area of 30 cm^2 and a height of 14 cm. Container B has a base area of 42 cm^2 and a height of 10 cm. Which container has the greater volume, or are the volumes equal? Explain using $V = Bh$.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Use the cylinder shown. Find its volume in terms of pi.	$72\pi \text{ cm}^3$
2	A cylinder has a base area of 25 cm^2 and a height of 6 cm. Find its volume.	150 cm^3
3	A cylinder has a base area of $7/2 \text{ m}^2$ and a height of 12 m. Find its volume.	42 m^3
4	Use the cylinder shown. Find its volume in terms of pi.	$175\pi \text{ in.}^3$
5	A cylinder has a diameter of 10 yd and a height of 11 yd. Find its volume in terms of pi.	$275\pi \text{ yd}^3$
6	A cylinder has a volume of $126\pi \text{ ft}^3$ and a base area of $18\pi \text{ ft}^2$. Find its height.	7 ft

PART 2 • APPLY IT

- 420 cm^3** Use $V = Bh$. Multiply 28 cm^2 by 15 cm.
- $468\pi \text{ cm}^3$** First find the base area: $\pi(6 \text{ cm})^2 = 36\pi \text{ cm}^2$. Then multiply 36π by 13.

CHALLENGE

The volumes are equal. Container A: $30 \times 14 = 420 \text{ cm}^3$. Container B: $42 \times 10 = 420 \text{ cm}^3$.

Accept equivalent volume forms with pi written after the numerical coefficient. For the challenge, accept any clear explanation showing that both products equal 420 cm^3 .