

# Cylinder Cover-Up

*Find the total area that covers a cylinder.*

**GRADE 7 • MA.7.GR.2.2**

**MA.7.GR.2.2** "Solve real-world problems involving surface area of right circular cylinders."

NAME \_\_\_\_\_

DATE \_\_\_\_\_

## SURFACE AREA RULE

For a closed right circular cylinder, surface area =  $2\pi r^2 + 2\pi rh$ . The first term covers the two circular bases, and the second term covers the curved side. If you are given a diameter, divide by 2 to find the radius.

## WORKED EXAMPLE

Find the total surface area of a closed cylinder with radius 5 cm and height 8 cm.

1.  $SA = 2\pi r^2 + 2\pi rh$
2.  $SA = 2\pi(5^2) + 2\pi(5)(8)$
3.  $SA = 50\pi + 80\pi$
4.  $SA = 130\pi \text{ cm}^2$

**Answer:  $130\pi \text{ cm}^2$**

## PRACTICE 6 problems

- 1** Find the total surface area of a closed cylinder with radius 3 cm and height 7 cm.

**ANSWER** \_\_\_\_\_

- 2** Find the total surface area of a closed cylinder with diameter 12 cm and height 4 cm.

**ANSWER** \_\_\_\_\_

- 3** Find the total surface area of a closed cylinder with radius 2 cm and height 11 cm.

**ANSWER** \_\_\_\_\_

- 4** Find the total surface area of a closed cylinder with radius 10 cm and height 9 cm.

**ANSWER** \_\_\_\_\_

- 5** Find the total surface area of a closed cylinder with diameter 14 cm and height 6 cm.

**ANSWER** \_\_\_\_\_

- 6** Find the total surface area of a closed cylinder with radius  $\frac{1}{2}$  cm and height 10 cm.

**ANSWER** \_\_\_\_\_

## APPLY IT Show your work

- 1** A snack company designs a cylindrical popcorn can with a radius of 4 cm and a height of 13 cm. How much metal is needed to cover the entire outside of the can, including the top and bottom?

WORK SPACE

ANSWER \_\_\_\_\_

- 2** You are covering a cylindrical pencil holder with patterned paper, including its top and bottom. The holder has a radius of 6 cm and a height of 15 cm. How much paper is needed?

WORK SPACE

ANSWER \_\_\_\_\_

## CHALLENGE One step up

### CHALLENGE

A closed cylinder has a radius of 6 cm and a total surface area of  $288\pi$  cm<sup>2</sup>. What is its height? Show how you use the surface area formula.

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## PART 1 • PRACTICE

| # | PROBLEM                                                                                 | ANSWER                                   |
|---|-----------------------------------------------------------------------------------------|------------------------------------------|
| 1 | Find the total surface area of a closed cylinder with radius 3 cm and height 7 cm.      | <b><math>60\pi \text{ cm}^2</math></b>   |
| 2 | Find the total surface area of a closed cylinder with diameter 12 cm and height 4 cm.   | <b><math>120\pi \text{ cm}^2</math></b>  |
| 3 | Find the total surface area of a closed cylinder with radius 2 cm and height 11 cm.     | <b><math>52\pi \text{ cm}^2</math></b>   |
| 4 | Find the total surface area of a closed cylinder with radius 10 cm and height 9 cm.     | <b><math>380\pi \text{ cm}^2</math></b>  |
| 5 | Find the total surface area of a closed cylinder with diameter 14 cm and height 6 cm.   | <b><math>182\pi \text{ cm}^2</math></b>  |
| 6 | Find the total surface area of a closed cylinder with radius $1/2$ cm and height 10 cm. | <b><math>21\pi/2 \text{ cm}^2</math></b> |

## PART 2 • APPLY IT

- $136\pi \text{ cm}^2$**  Use  $2\pi r^2 + 2\pi rh$  with  $r = 4$  and  $h = 13$ . The two bases have area  $32\pi \text{ cm}^2$ , and the curved side has area  $104\pi \text{ cm}^2$ .
- $252\pi \text{ cm}^2$**  Use  $2\pi r^2 + 2\pi rh$  with  $r = 6$  and  $h = 15$ . Add  $72\pi \text{ cm}^2$  for the two bases and  $180\pi \text{ cm}^2$  for the curved side.

## CHALLENGE

**18 cm**

Accept equivalent exact forms, such as  $10.5\pi \text{ cm}^2$  for  $21\pi/2 \text{ cm}^2$ . Students should use radius, not diameter, in the surface area formula.