

Cylinder Net Quest

Find total surface area from a cylinder net.

GRADE 7 • MA.7.GR.2.1

MA.7.GR.2.1 "Given a mathematical or real-world context, find the surface area of a right circular cylinder using the figure's net."

NAME _____

DATE _____

OPEN THE CYLINDER

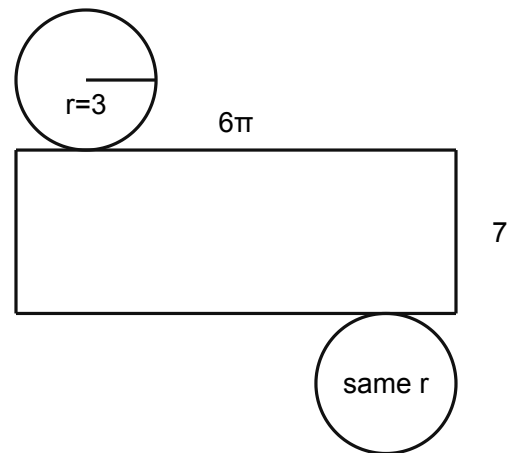
A closed cylinder opens into two congruent circles and one rectangle. Find each circle area with πr^2 . The rectangle length wraps around a circular end, so it equals $2\pi r$; its other dimension is the cylinder height. Add the three areas. All net dimensions here are centimeters; leave area answers in terms of π .

WORKED EXAMPLE

Use the net to find the total surface area of a closed cylinder. The circle radius is 3 cm and the rectangle height is 7 cm.

1. Two circles: $2\pi(3)^2 = 18\pi$.
2. Rectangle: $2\pi(3)(7) = 42\pi$.
3. Add: $18\pi + 42\pi = 60\pi$.

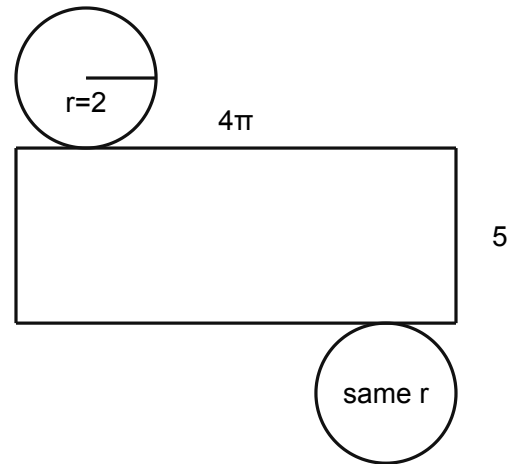
Answer: $60\pi \text{ cm}^2$



PRACTICE 4 problems

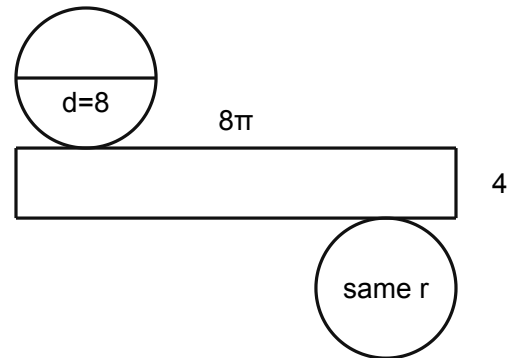
- 1** A cylinder net has radius 2 cm and height 5 cm.
Find its surface area.

ANSWER _____



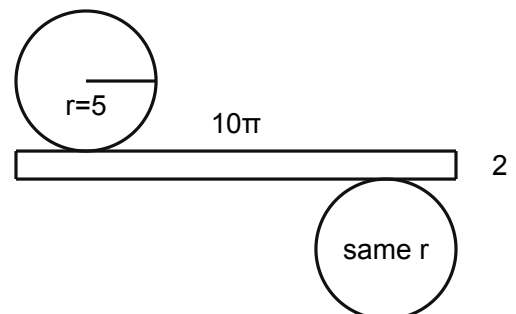
- 2** A cylinder net has two circles with diameter 8 cm.
The rectangle is 4 cm tall. Find its surface area.

ANSWER _____



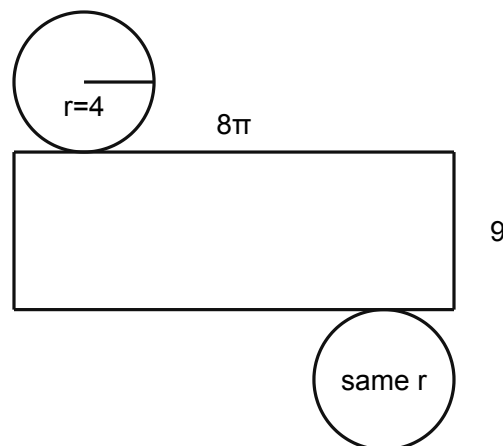
- 3** A cylinder net has radius 5 cm and height 2 cm.
Find its surface area.

ANSWER _____



- 4 A net has a rectangle measuring 8π cm by 9 cm and two circles with radius 4 cm. Find its surface area.

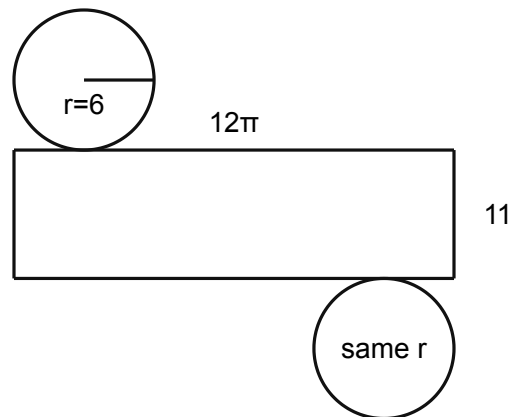
ANSWER _____



APPLY IT

Show your work

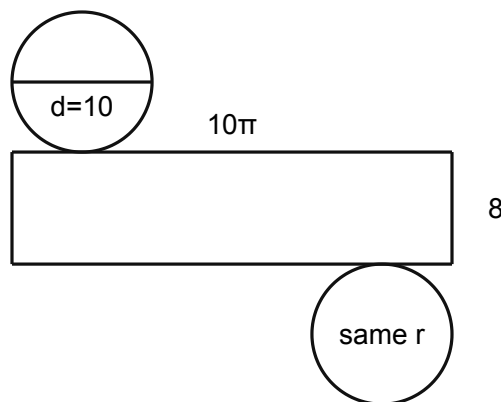
- 1 A club covers every outside face of a closed cylindrical game-token tin, including both ends. Use its net to find the material needed.



2

A poster tube has diameter 10 cm and height 8 cm.

Find the cardboard area in its net, including both circular ends.

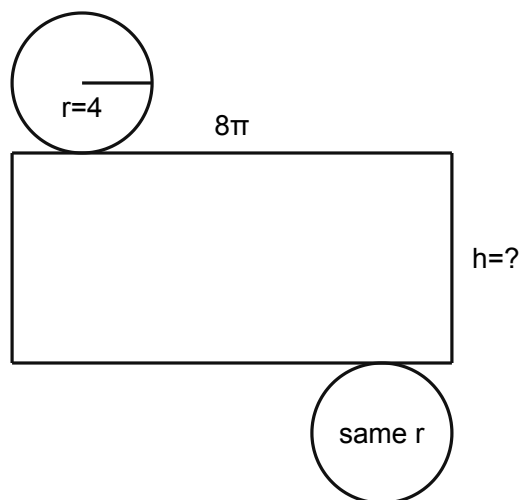


CHALLENGE

One step up

This closed cylinder has total surface area 128π square centimeters. Its net has circles of radius 4 cm and a rectangle of length 8π cm. Find the unknown rectangle height h . Explain what h means on the cylinder. The unknown height in this sketch is schematic.

WORK SPACE AND ANSWER



Use the net to add the areas of two circles and one rectangle; memorizing the combined formula is unnecessary. Diameter tasks require halving the diameter. All known-dimension nets use one geometric scale. Do not measure the unknown height from the challenge drawing. Accept equivalent exact expressions and require square centimeters for area.

PRACTICE 1

$$28\pi \text{ cm}^2$$

PRACTICE 2

$$64\pi \text{ cm}^2$$

PRACTICE 3

$$70\pi \text{ cm}^2$$

PRACTICE 4

$$104\pi \text{ cm}^2$$

APPLY IT 1

$$204\pi \text{ cm}^2$$

The two circular ends have area $72\pi \text{ cm}^2$. The rectangle in the net has area $132\pi \text{ cm}^2$, for $204\pi \text{ cm}^2$ total.

APPLY IT 2

$$130\pi \text{ cm}^2$$

The radius is 5 cm. Add $2\pi(5)^2$ and $2\pi(5)(8)$.

CHALLENGE

12 cm. The rectangle's height is the cylinder's height.