Inspiring Greatness

INDEPENDENCE SCHOOL DISTRICT

Math Virtual Learning

Geometry/Honors Geometry

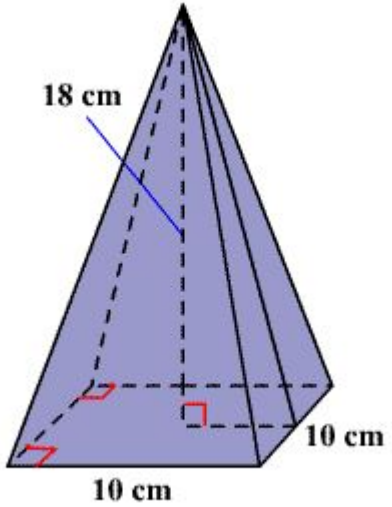
Volume of Cylinders

April 30, 2020

Geometry/Honors Geometry
Lesson: April 30, 2020

Objective/Learning Target:
Students will calculate the volume of cylinders.

Bell Ringer: Find the volume of the pyramid.



Bell Ringer Answer: 600 cubic centimeters

Let's Get Started: Go through the following slides and try the example problems.

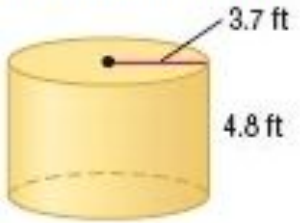
Warm-Up:

Watch Video: Volume of Cylinders

Click on the link then click “Join” and Complete the slides that follow: Desmos Cylinders Volume Activity

Example:

Find the volume of each cylinder. Round to the nearest tenth.



SOLUTION:

$$V = Bh$$
$$= \pi r^2 \cdot h$$
$$= \pi(3.7)^2(4.8)$$
$$\approx 206.4 \text{ ft}^3$$

Example:

a cylinder with a diameter of 16 centimeters and a height of 5.1 centimeters

SOLUTION:

$$V = Bh$$
$$= \pi r^2 \cdot h$$
$$= \pi (8)^2 (5.1)$$
$$\approx 1025.4 \text{ cm}^3$$

Example:

SANDCASTLES In a sandcastle competition, contestants are allowed to use only water, shovels, and 10 cubic feet of sand. To transport the correct amount of sand, they want to create cylinders that are 2 feet tall to hold enough sand for one contestant What should the diameter of the cylinders be?

SOLUTION:

$V = 10$ ft^3 and $h = 2$ ft Use the formula to find r.

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

$$\pi r^2 (2) = 10$$

$$r^2 = \frac{10}{2\pi}$$

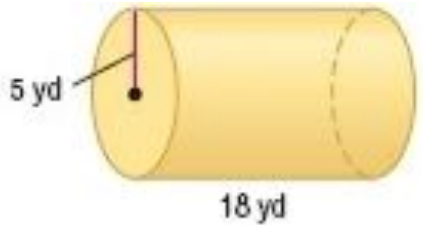
$$\approx 1.59$$

$$r \approx 1.26$$

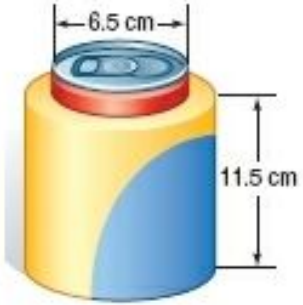
Therefore, the diameter of the cylinders should be about 2.52 ft.

Practice:

1) Find the volume of the cylinder.



2) **MANUFACTURING** A can 12 centimeters tall fits into a rubberized cylindrical holder that is 11.5 centimeters tall, including 1 centimeter for the thickness of the base of the holder. The thickness of the rim of the holder is 1 centimeter. What is the volume of the rubberized material that makes up the holder?



Answer Key:

Once you have completed the problems, check your answers here.

1) ***SOLUTION:***

$r = 5$ yd and $h = 18$ yd

$$V = \pi r^2 h$$
$$= \pi(5)^2 \cdot 18$$
$$\approx 1413.7 \text{ yd}^3$$

2) ***SOLUTION:***

The volume of the rubberized material is the difference between the volumes of the container and the space used for the can. The container has a radius of $\frac{6.5}{2} + 1 = 4.25$ cm and a height of 11.5 cm. The empty space used to keep the can has a radius of 3.25 cm and a height of 11.5 – 1 = 10.5 cm. The volume V of a cylinder is $V = \pi r^2 h$, where r is the radius of the base and h is the height of the cylinder.

$$\begin{aligned} V_{\text{rubberized material}} &= \pi r_c^2 h_c - \pi r_e^2 h_e \\ &= \pi(4.25)^2(11.5) - \pi(3.25)^2(10.5) \\ &\approx 304.1 \end{aligned}$$

Therefore, the volume of the rubberized material is about 304.1 cm^3.

Additional Practice:

Interactive Practice

Extra Practice with Answers