

Lesson 8.1:

Volumes of Cylinders

Jan 24-12:50 PM

Essential Question

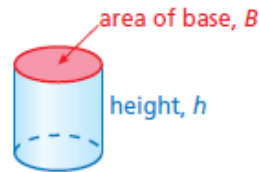
How can you find the volume of a cylinder?

Essential Question

Key Idea

Volume of a Cylinder

Words The volume V of a cylinder is the product of the area of the base and the height of the cylinder.



Algebra

$$V = Bh$$

Area of base

Height of cylinder

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

A cylinder is basically a circular prism.

Key Idea

Find the volume of the cylinder. Round your answer to the nearest tenth.

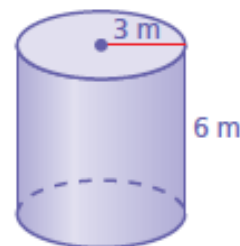
$$V = Bh$$

$$\pi \cdot (3\text{m})^2 \cdot 6\text{m}$$

$$\pi \cdot 9\text{m}^2 \cdot 6\text{m}$$

$$28.26\text{m}^2 \cdot 6\text{m}$$

$$V = 169.56\text{m}^3 \rightarrow 169.6\text{m}^3$$



Example 1

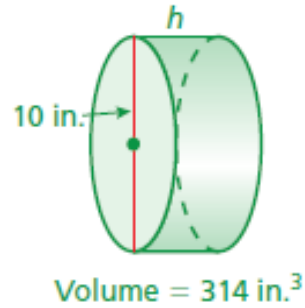
Find the height of the cylinder. Round your answer to the nearest whole number.

$$B = 3.14 \cdot (5 \text{ in})^2$$

$$3.14 \cdot 25 \text{ in}^2$$

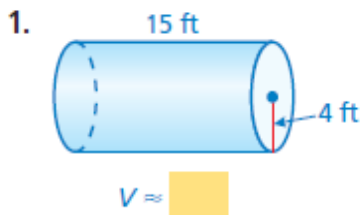
$$78.5 \text{ in}^2$$

$$\begin{array}{r} 314 \text{ in}^3 = 78.5 \text{ in}^2 \cdot h \\ \div 78.5 \text{ in}^2 \quad \div 78.5 \text{ in}^2 \\ \hline 4 \text{ in} = h \end{array}$$

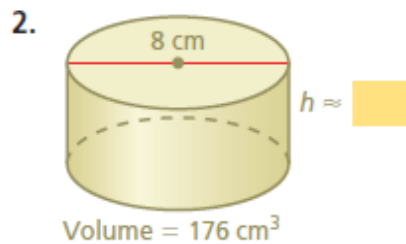


Example 2

Find the volume V or height h of the cylinder. Round your answer to the nearest tenth.



$$\begin{array}{l} 3.14 \cdot (4 \text{ ft})^2 \cdot 15 \text{ ft} \\ 3.14 \cdot 16 \text{ ft}^2 \cdot 15 \text{ ft} \\ 50.24 \text{ ft}^2 \cdot 15 \text{ ft} \\ 753.6 \text{ ft}^3 \end{array}$$



$$\begin{array}{l} 176 \text{ cm}^3 = 3.14 \cdot (8 \text{ cm})^2 \cdot h \\ 176 \text{ cm}^3 = 3.14 \cdot 64 \text{ cm}^2 \cdot h \\ 176 \text{ cm}^3 \div 50.24 \text{ cm}^2 \quad 50.24 \text{ cm}^2 \cdot h \div 50.24 \text{ cm}^2 \\ \hline 3.5 \text{ cm} = h \end{array}$$

On your own 1-2

How much salsa is missing from the jar?

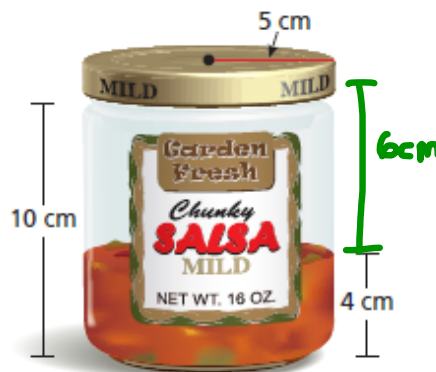
$$V = Bh$$

$$3.14 \cdot (5\text{cm})^2 \cdot 6\text{cm}$$

$$3.14 \cdot 25\text{cm}^2 \cdot 6\text{cm}$$

$$78.5\text{cm}^2 \cdot 6\text{cm}$$

$$471\text{cm}^3$$



Example 3

About how many gallons of water does the watercooler bottle contain? ($1\text{ft}^3 \approx 7.5\text{gal}$)

- Ⓐ 5.3 gallons 10 gallons Ⓒ 17 gallons Ⓓ 40 gallons



$$3.14 \cdot (0.5\text{ft})^2 \cdot 1.7\text{ft}$$

$$3.14 \cdot 0.25\text{ft}^2 \cdot 1.7\text{ft}$$

$$0.785\text{ft}^3 \cdot 1.7\text{ft}$$

$$1.3345\text{ft}^3 \cdot 7.5 \approx 10\text{gallons}$$

Example 4