

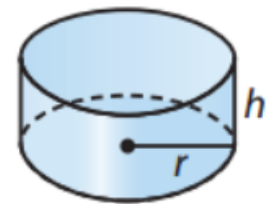
13.1 Volume of Cylinders

Common Core Standard

8.G.9

Know the formulas for the volume of cones, cylinders, and spheres and use them to solve real-world and mathematical problems

Cylinder - a three-dimensional figure that has 2 congruent circular bases that lie in parallel planes



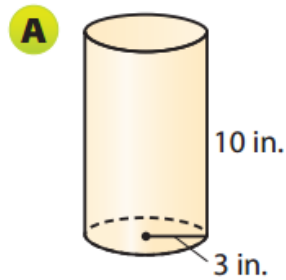
Volume of a Cylinder

The volume of a cylinder V with a radius r is the area of the base B times the height h .

$$V = \underbrace{B}_{\pi r^2} h \quad \text{or} \quad V = \pi r^2 h$$

Make sure you are using radius

Find the volume of each cylinder. Round your answers to the nearest tenth if necessary. Use 3.14 for π .

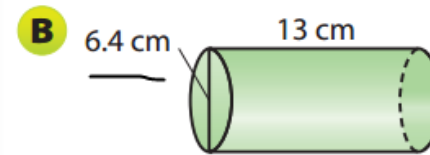


$$V = \pi r^2 h$$

$$V = 3.14(3)^2 \times 10$$

$$= 3.14 \times 9 \times 10$$

$$V \approx 282.4 \text{ in}^3$$



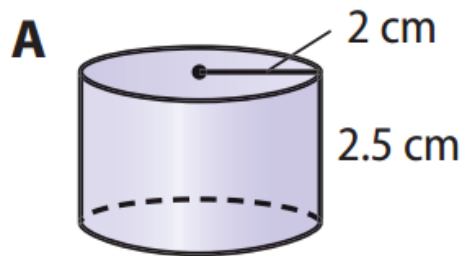
$$V = \pi r^2 h$$

$$= 3.14(6.4)^2 \times 13$$

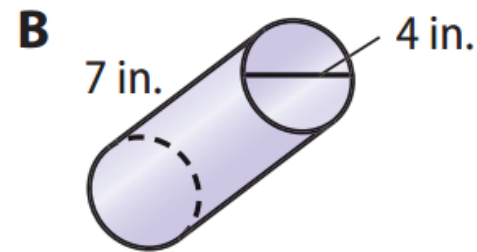
$$= 3.14 \times 40.96 \times 13$$

$$\approx 1658.8 \text{ cm}^3$$

**Find the volume of each cylinder.
Round your answers to the nearest
tenth if necessary. Use 3.14 for π .**

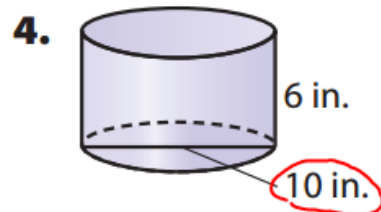


$$\begin{aligned}
 V &= \pi r^2 h \\
 &= 3.14(2)^2 \times 2.5 \\
 &= 3.14 \times 4 \times 2.5 \\
 &\approx 31.4 \text{ cm}^3
 \end{aligned}$$

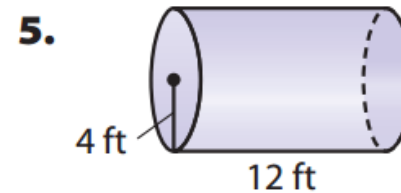


$$\begin{aligned}
 V &= \pi r^2 h \\
 &= 3.14(4)^2 \times 7 \\
 &= 3.14 \times 16 \times 7 \\
 &= 87.9 \text{ in}^3
 \end{aligned}$$

Find the volume of each cylinder. Round your answers to the nearest tenth if necessary. Use 3.14 for π .



$$\begin{aligned} V &= \pi r^2 h \\ &= 3.14 \times 5^2 \times 6 \\ &= 3.14 \times 25 \times 6 \\ &= 471 \text{ in}^3 \end{aligned}$$



$$\begin{aligned} V &= \pi r^2 h \\ &= 3.14 \times 4^2 \times 12 \\ &= 3.14 \times 16 \times 12 \\ &= 602.9 \text{ ft}^3 \end{aligned}$$

Big Bertha has a diameter of 8 feet and is 4.5 feet deep. Find the volume of the drum to the nearest tenth. Use 3.14 for π .

STEP 1 Find the radius of the drum.

$$r = \frac{d}{2} = \frac{8}{2} = 4$$

STEP 2 Find the volume of the drum.

$$\begin{aligned} V &= \pi r^2 h \\ &= 3.14 \times 4^2 \times 4.5 \\ &= 3.14 \times 16 \times 4.5 \\ &\approx 226.08 \text{ ft}^3 \end{aligned}$$



A cylindrical silo that stores grain has a diameter of 16 feet and is 40 feet tall. Find the volume of the silo to the nearest tenth. Use 3.14 for π .

$$\begin{aligned}V &= \pi r^2 h \\ &= 3.14 \times 8^2 \times 40 \\ &= 3.14 \times 64 \times 40 \\ &= 8,038.4 \text{ ft}^3\end{aligned}$$



A drum company advertises a snare drum that is 4 inches high and 12 inches in diameter. Find the volume of the drum to the nearest tenth. Use 3.14 for π .

$$\begin{aligned}V &= \pi r^2 h \\ &= 3.14 \times 6^2 \times 4 \\ &= 3.14 \times 36 \times 4 \\ &= 452.2 \text{ in}^3\end{aligned}$$



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IP p403 6-20