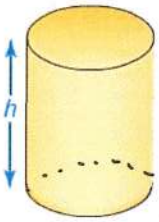
Volumes of Cylinders



The formula for the volume of a cylinder is the area of the base times the height.

The area of the circular base is represented by πr^2.

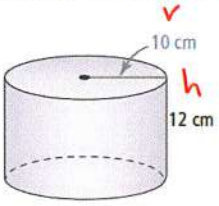
$V = Bh$

$= (\pi r^2)h$

$= \pi r^2 h$

The volume of a cylinder is represented by $\pi r^2 h$.

EX: (1) Find the volume. Leave the answer in terms of π.



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

$V = \pi \cdot 10^2 \cdot 12$

$V = \pi \cdot 100 \cdot 12$

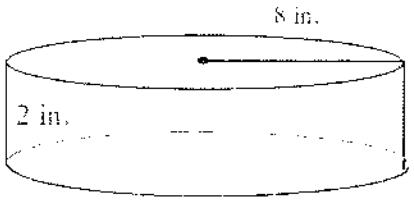
$V = \pi \cdot 1200$

$V = 1200\pi \text{ cm}^3$

★ Read the directions! Sometimes you leave your answer in terms of π, and other times you are asked to use 3.14 for π ★

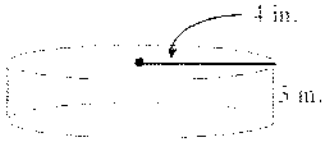
Lesson 13-2 Homework

1. Find the volume of the cylinder. Write an exact answer in terms of π.



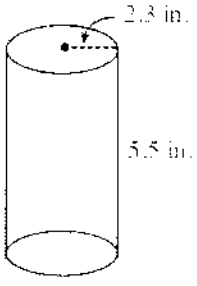
(This figure is not to scale.)

2. a) Find the volume of the cylinder. Write an exact answer in terms of π.
   b) Find the volume of a cylinder with the same radius and double the height. Write an exact answer in terms of π.



(This figure is not to scale.)

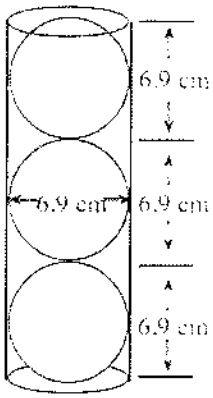
3. A can of vegetables has a radius 2.3 in. and a height 5.5 in. Find the volume of the can. Use 3.14 for π. Round to the nearest tenth as needed.



(This figure is not to scale.)

4. Find the volume of a cylinder with radius 10 m and height 8 m. Write an exact answer in terms of π.

5. Toy rubber balls are packaged in a cylinder that holds 3 balls. The diameter of each ball is 6.9 cm. Find the volume of the cylinder. Use 3.14 for π. Round to the nearest tenth as needed.

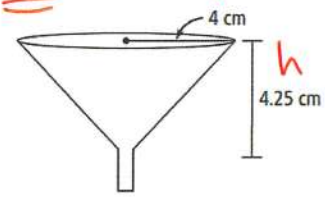


Volumes of Cones

$V = \frac{1}{3}\pi r^2 h$ (OR) $V = \frac{\pi r^2 h}{3}$

EX: ①

Find the volume of the funnel to the nearest cubic centimeter. Use 3.14 for π.



They're asking me to round to a whole #.

$V = \frac{\pi \cdot r^2 \cdot h}{3}$

$V = \frac{3.14 \cdot 4^2 \cdot 4.25}{3}$

$V = \frac{3.14 \cdot 16 \cdot 4.25}{3}$

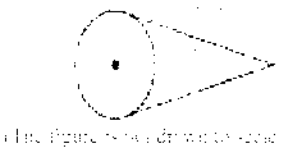
$V = \frac{213.52}{3}$

$V = 71.17\overline{3}\ cm^3$

$V \approx 71\ cm^3$

Lesson 13-4 Homework

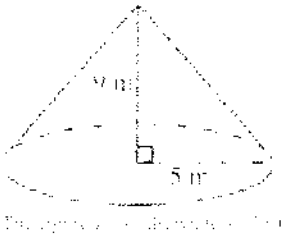
1. What is the exact volume of the figure? Write an exact answer in terms of π.



2. Order the cones described below from least to greatest volume.
   Cone 1: radius 6 cm and height 12 cm
   Cone 2: radius 12 cm and height 6 cm
   Cone 3: radius 9 cm and height 8 cm

3. How many cubic meters of material are there in a conical pile of dirt that has radius 11 meters and height 6 meters? Use 3.14 for π. Round to the nearest hundredth as needed.

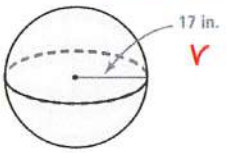
4. Find the exact volume of the cone. Write an exact answer in terms of π.



Volumes of Spheres

$V = \frac{4}{3}\pi r^3$ (OR) $V = \frac{4\pi r^3}{3}$

EX: ① Find the volume of the sphere to the nearest cubic inch. Use 3.14 for π.



They want me to round to a whole #.

$V = \frac{4 \cdot \pi \cdot r^3}{3}$

$V = \frac{4 \cdot 3.14 \cdot 17^3}{3}$

$V = \frac{4 \cdot 3.14 \cdot 4913}{3}$

$V = \frac{61707.28}{3}$

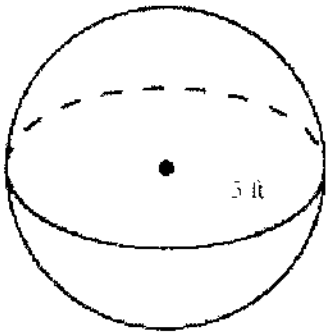
$V = 20{,}569.09\overline{3}\ in^3$

$V \approx 20{,}569\ in^3$

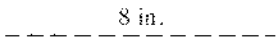
Lesson 13-6 Homework

1. A solid plastic ball is a sphere with radius 8 in. How much plastic does it take to make one ball? Use 3.14 for π. Round to the nearest hundredth as needed.

2. Find the volume of the sphere to the nearest cubic foot. Use 3.14 for π.

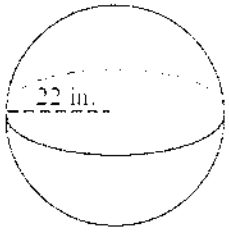


3. Find the volume of the figure. Use 3.14 as the value of π. Round to the nearest whole number.



4. A spherical boulder is 20 ft in diameter and weighs almost 8 tons. Find the volume. Use 3.14 for π. Round to the nearest whole number as needed.

5. What is the volume of the sphere? Use 3.14 for π. Round to the nearest hundredth as needed.



6. A certain machine in a factory fills a spherical mold with plastic. If the diameter of the mold is 26.2 inches, how many cubic inches of plastic will it take to fill the mold? Use 3.14 for π. Round to the nearest hundredth as needed.