Name Key Date

CCSS: 8.G.9

Lesson 28: Volume

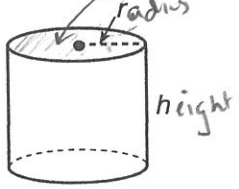
Brain pop: volum of a cylinder

Volume (V) is the amount of space a solid takes up. It is measured in cubic units.

Cylinders

Base = Circle (πr^2)

Cylinder

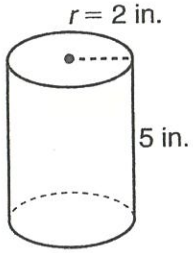


$V = \pi r^2 h$

where r = radius of the base
h = height
$\pi \approx 3.14$

Example

What is the volume of this cylinder?



$V = Bh$

B = area of the base

Use the following formula.

$V = \pi r^2 h$

$= 3.14 \cdot (2)^2 \cdot (5)$

$= 3.14 \cdot 4 \cdot 5$

$= 62.8$

The volume of the cylinder is approximately 62.8 in.^{3}.

units^3

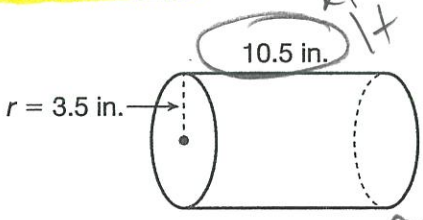
* When you are given the diameter, you have to Divide it by 2.

$R = \frac{D}{2}$

Examples

$V = \pi r^2 h$

1) What is the volume of this cylinder? Use 3.14 for π.

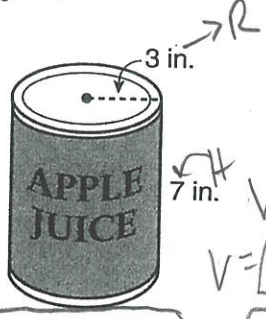


P
E
MID
A's

A. 192.325 in.^{3}
B. 307.72 in.^{3}
C. 403.8825 in.^{3}
D. 2307.9 in.^{3}

$V = \pi r^2 h$
$V = (3.14) \cdot (3.5)^2 \cdot (10.5)$
$V = (3.14) \cdot (12.25) \cdot (10.5)$
$V = 403.8825$

2) What is the volume of this container of apple juice?



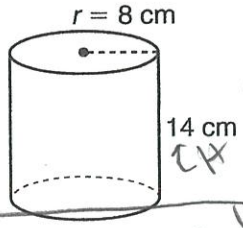
$V = \pi r^2 h$
$V = \pi \cdot (3)^2 \cdot (7)$
$V = \pi \cdot (9) \cdot (7)$
$V = 197.9203372$

$V = 197.9203372 in^3$

★ use π button B/c they didn't tell you what to use for π

Don't round your answer when they don't tell you what to round to

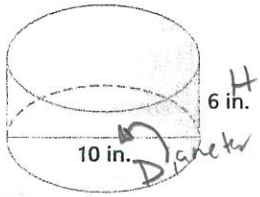
3) What is the volume of the following cylinder? Use 3.14 for π and round your answer to the nearest whole number.



$V = \pi r^2 h$
$V = (3.14) \cdot (8)^2 \cdot (14)$
$V = (3.14) \cdot (64) \cdot (14)$
$V = 2813$

$V = 2813 cm^3$

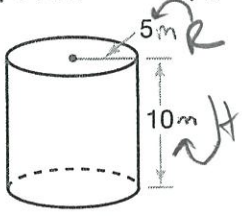
4) The top layer of a wedding cake has a diameter of 10 inches and a height of 6 inches. Find the volume of th top layer of the cake. Round your answer to the nearest tenth if necessary. Use 3.14 for π.



$V = \pi r^2 h$
$V = (3.14) \cdot (5)^2 (6)$
$V = (3.14) \cdot 25 \cdot (6)$
$V = 471.0 in^3$

$R = \frac{D}{2}$
$R = \frac{10}{2}$
$R = 5$

5) Find the volume:



* Round to the nearest tenth

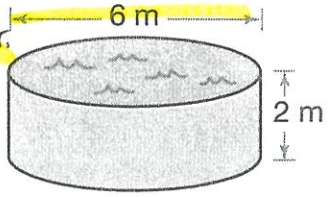
$V \approx 785.4 m^3$

$V = \pi r^2 h$
$V = \pi \cdot (5)^2 \cdot (10)$
$V = \pi \cdot 25 \cdot 10$
$V = 785.4 m^3$

★ use π button B/c they didn't tell you what to use for π

6) About how many cubic meters of water will this swimming pool hold if it is filled to capacity? Round to the nearest whole meter.

whole # Diameter



$V = \pi r^2 h$

$V = \pi \cdot (3)^2 \cdot (2)$

$V = \pi \cdot 9 \cdot 2$

$V = 57 m^3$

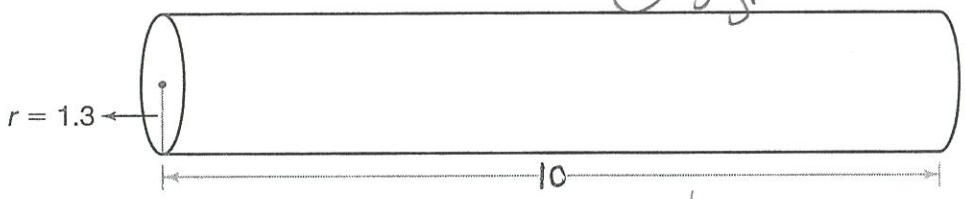
↑ use π button B/c they didn't tell you what to use for π

$R = \frac{D}{2}$

$R = \frac{6}{2}$

$R = 3$

7) Find the volume of the following cylinder. Keep your answer in terms of π. leaves the symbol: don't use the calculator to multiply



$V = \pi r^2 h$

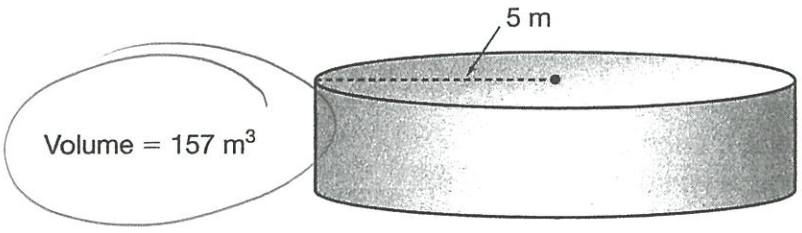
$V = \pi \cdot (1.3)^2 \cdot (10)$

$V = \pi \cdot (1.69) \cdot 10$

$V = \pi \cdot 16.9$

$V = 16.9\pi\ v^3$

8) A cylindrical gas tank has a capacity of approximately 157 m^3. Its radius is 5 m.



$V = \pi r^2 h$

$157 = \pi \cdot (5)^2 \cdot h$

$157 = \pi \cdot 25 \cdot h$

$\frac{157}{25\pi} = \frac{\pi \cdot 25 \cdot h}{25\pi}$

$h \approx 2$

What is the height of the cylindrical gas tank? 2

Explain how you found the height of the gas tank.

I filled in the information I had into the volume formula (volume + radius) + I used algebra to solve for the height