

Name: _____ Class Period: _____

Volume Lesson Guide

Due Date: _____

Spheres

GRADE

- Watch video lesson and take notes as you go.
<http://www.showme.com/sh/?h=U85AHgG>
- Complete practice problems and check your answers.

Rectangular Prism and Cylinders

GRADE

- Watch video lesson and take notes as you go.
<http://www.showme.com/sh/?h=qE2NsES>
- Complete practice problems and check your answers.

Pyramids and Cones

GRADE

- Watch video lesson and take notes as you go.
<http://www.showme.com/sh/?h=WoY6Yme>
- Complete practice problems and check your answers.

Compound Volume

GRADE

- Small group – assigned by teacher
- Complete practice problems and check your answers.

Mixed Review for Quiz

GRADE

- Small group – assigned by teacher
- Complete practice problems and check your answers.

Give me feedback by answering the following questions:

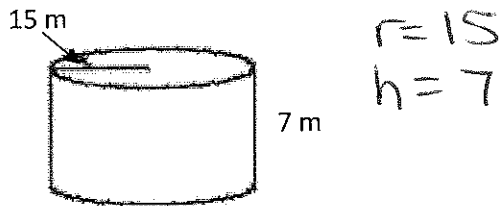
1. What did you like most about doing the video lessons? _____

2. What did you dislike about doing the video lessons? _____

3. Would you like to do a module lesson like this again? _____
4. What do you think I could have done differently to make this better? _____

CYLINDERS

$$V = Bh \text{ or } V = \pi r^2 h$$



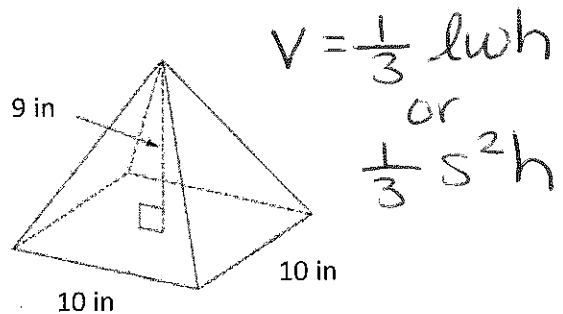
$$V = \pi (15)^2 (7)$$
$$V = 1575\pi \text{ m}^3$$

or

$$4948.008 \text{ m}^3$$

PYRAMIDS

$$V = \frac{1}{3} Bh \text{ (B = Area of Base)}$$



$$V = \frac{1}{3} lwh$$

or

$$\frac{1}{3} s^2 h$$
$$V = \frac{1}{3} (10)(10)(9)$$
$$V = 300 \text{ in}^3$$

Area of a Triangle: $A = \frac{1}{2} bh$

Area of a Circle: $A = \pi r^2$

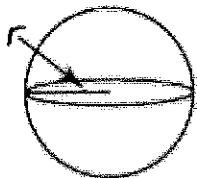
Area of a Square: $A = s^2$

Area of a Rectangle: $A = lw$

SPHERES

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

$r = 7$ meters



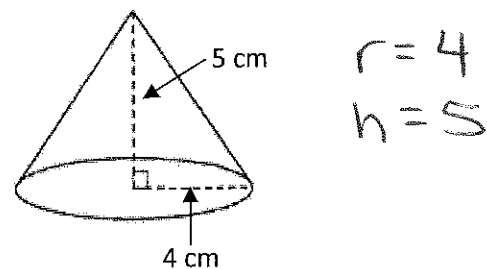
$$V = \frac{4}{3} \pi (7)^3$$
$$V = \frac{1372\pi}{3} \text{ m}^3$$

OR

$$1436.755 \text{ m}^3$$

CONES

$$V = \frac{1}{3} Bh \text{ or } V = \frac{1}{3} \pi r^2 h$$



$$V = \frac{1}{3} \pi (4)^2 (5)$$
$$V = \frac{80\pi}{3} \text{ cm}^3$$

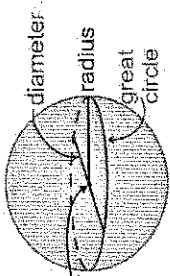
OR

$$83.776 \text{ cm}^3$$

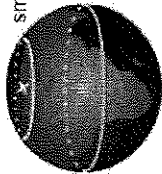
Volume : Spheres

Volume of a Sphere: $V = \frac{4}{3} \pi r^3$

A sphere is the locus of points in space that are a given distance from a point called the center of the sphere.



A radius of a sphere is a segment from the center to a point on the sphere. A diameter of a sphere is a chord that contains the center.

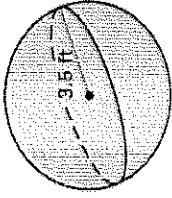


If a plan that intersects a sphere contains the center of the sphere, the intersection is a great circle of the sphere. A great circle of a sphere separates the sphere into 2 congruent halves called hemispheres.

EXAMPLE 1 Finding the Volume of a Sphere

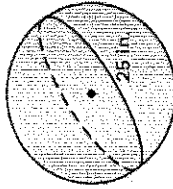
Find the volume of the sphere.

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



EXAMPLE 2 Using a Great Circle

The circumference of a great circle of a sphere is 25 inches. Find the volume of the sphere.

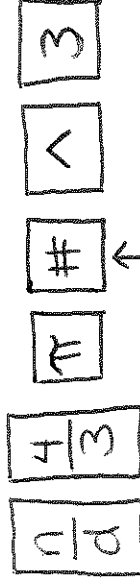


1. Find the radius using the Circumference.

2. Use the radius to calculate the volume.

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

How to cube in your calculator:



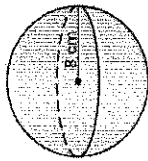
↑
your radius

Find the Volume: $V = \frac{4}{3} \pi r^3$

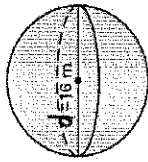
Exercises for Example 1

Find the volume of the sphere.

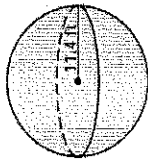
1.



2.



3.

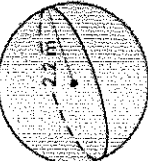


Find the Volume: $V = \frac{4}{3} \pi r^3$

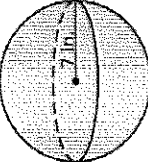
Exercises for Example 1

Find the volume of the sphere.

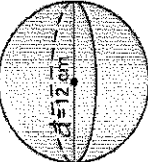
4.



5.



6.



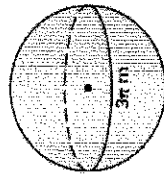
Using the Great Circle:

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

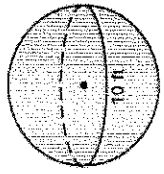
Exercises for Example 2

Find the volume of the sphere using the great circle.

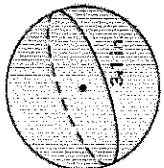
7.



8.



9.



Volume: Rectangular Prisms & Cylinders


Volume


The number of cubic units contained in an object's interior.

Cavalieri's Principle - If 2 solids have the same height and the same cross-sectional area at every level, then they have the same volume.

Volume

The number of cubic units contained in an object's interior.

Prism: 

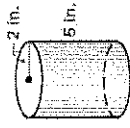
Cylinder: 

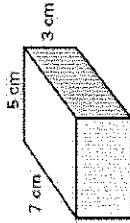
$$V = Bh$$

Area of the Base height

EXAMPLE 1 Finding Volumes

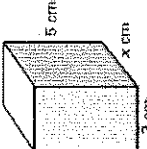
Find the volume of the right cylinder and the right prism.

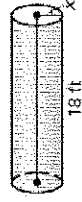
a.  2 in. 5 in.

b.  7 cm 5 cm 3 cm

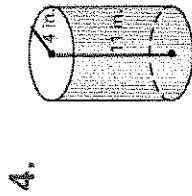
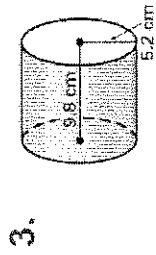
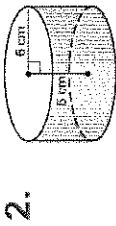
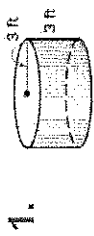
EXAMPLE 2 Using Volumes

Use the measurements given to solve for x .

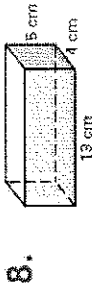
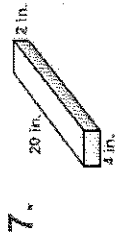
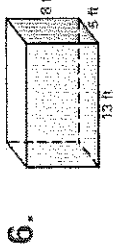
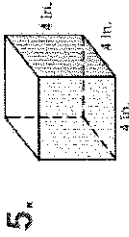
a. $V = 60 \text{ cm}^3$  5 cm x cm 3 cm

b. $V = 475 \text{ ft}^3$  18 ft x

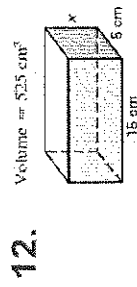
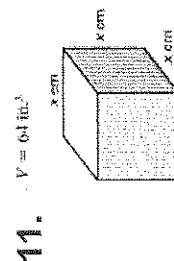
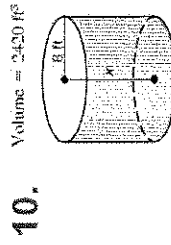
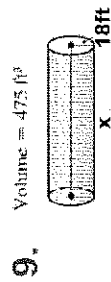
Find the Volume: $V = Bh$



Find the Volume: $V = Bh$



Find the requested measurement:



Challenge: BONUS



A soda can is 4.75 inches tall and has a volume of 21 inches³.

Coca-Cola wants to package 12 cans in a case for easy shipping and shelf storage.

1. What do the dimensions of the package need to be?
2. What is the volume of the package?

Volume: Pyramids & Cones

Volume:

Pyramid: $V = \frac{1}{3} Bh$

Cone:

Area of the Base

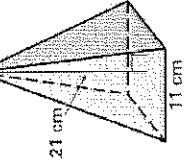
height



Ask yourself... what shape is the base?

EXAMPLE 1 Finding the Volume of a Pyramid

$$V = \frac{1}{3} Bh$$



Find the volume of the pyramid with the square base shown to the right.

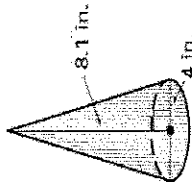
What shape is the base?

How do I find the Area of the Base?

How do I calculate the volume?

EXAMPLE 2 Finding the Volume of a Cone

$$V = \frac{1}{3} Bh$$



Find the volume of the cone.

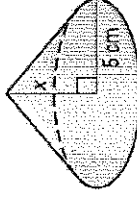
What shape is the base?

How do I find the Area of the Base?

How do I calculate the volume?

EXAMPLE 3 Using the Volume of a Cone

$$V = 105 \text{ cm}^3$$



Use the given measurements to solve for x.

What is the formula for the volume of a cone?

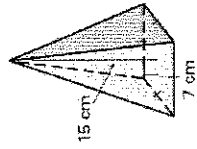
What does "B" stand for?

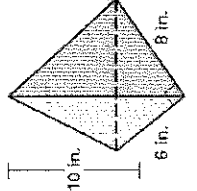
Plug in what you know and solve for the missing part.

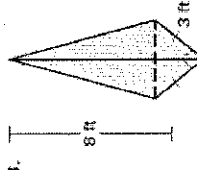
#2 & 3 → Base is a Triangle
 $A = \frac{1}{2}bh$

Find the Volume: $V = \frac{1}{3}Bh$

Exercises for Example 1
 In Exercises 1–3, find the volume of the pyramid.

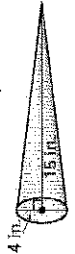
1. 

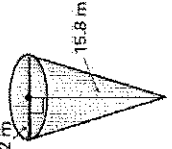
2. 

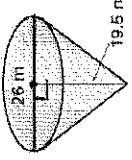
3. 

Find the Volume: $V = \frac{1}{3}Bh$

Exercises for Example 2
 Find the volume of the cone.

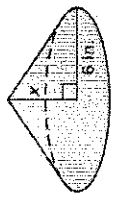
4.  $r = 4$

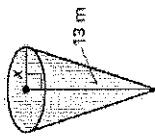
5.  $r = 9.2$

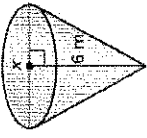
6.  $d = 26$

Find x given the volume: $V = \frac{1}{3}Bh$

Exercises for Example 3
 In Exercises 7–9, find the value of x.

7.  $V = 182 \text{ in.}^3$

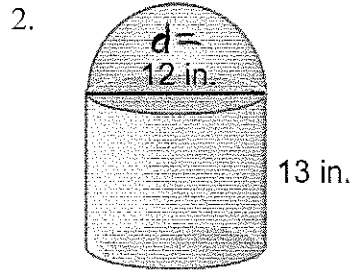
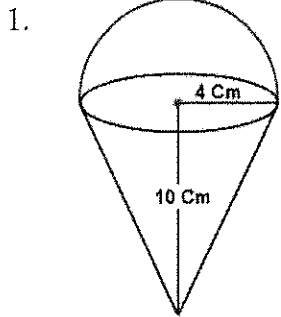
8.  $V = 215 \text{ m}^3$

9.  $V = 56.5 \text{ m}^3$

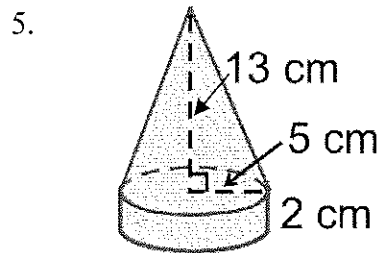
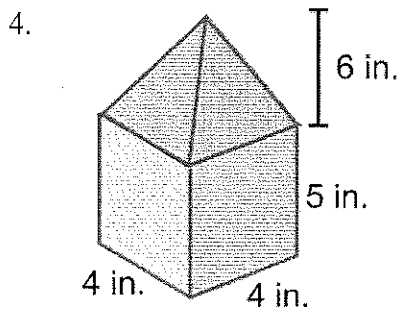
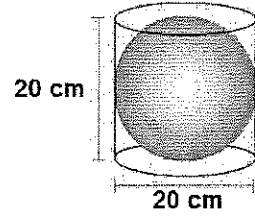
Finding the Volume of Compound Figures

Name: _____

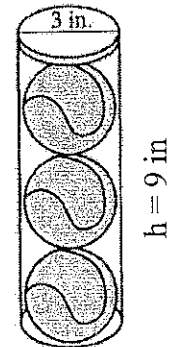
Examples:



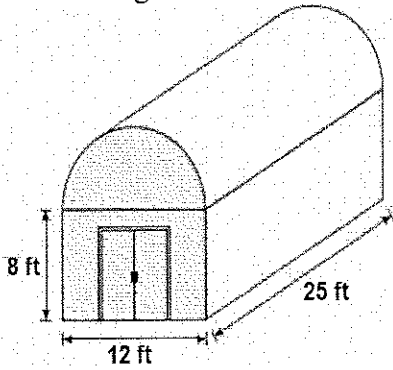
3. How much empty space is in the container?



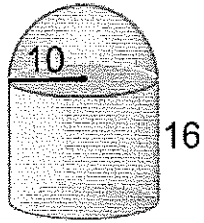
6. How much empty space is in the container?



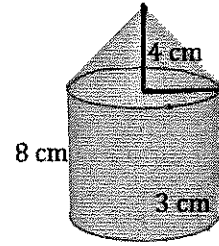
7. Find the Volume of the Building.



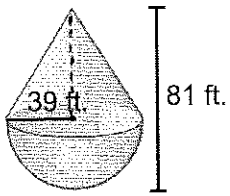
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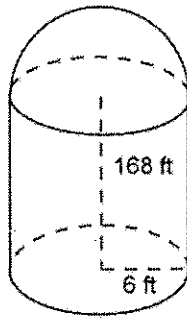
9.



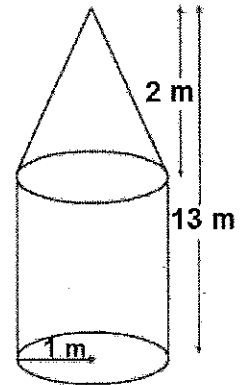
10.



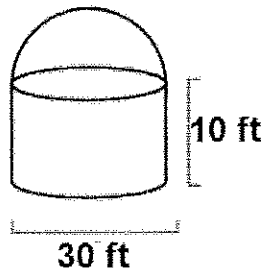
11.



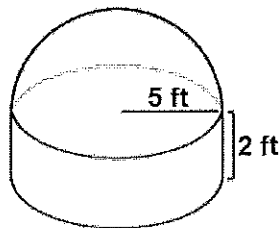
12.



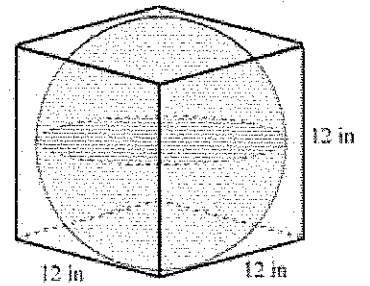
13.



14.

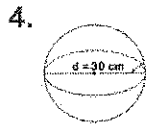
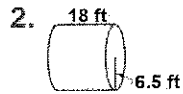
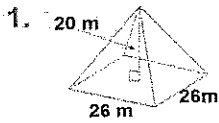


15. How much empty space is in the box?

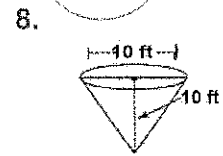
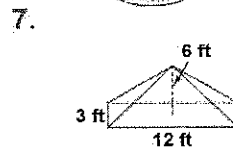
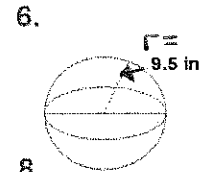
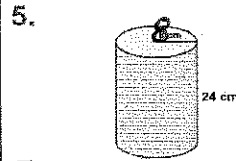


Volume Review

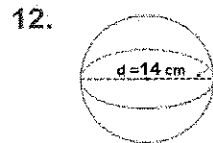
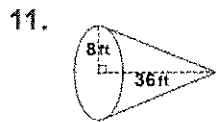
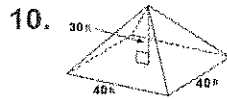
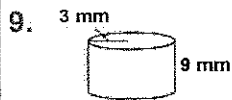
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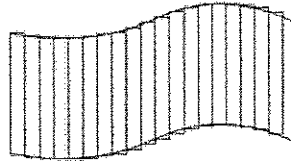
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13. Find the area of the picture below given the height of each rectangle is 26 yards and the base of each rectangle is 4 yards.



14. A cylinder has a radius of 10 inches and a height of 31 inches. What is the approximate volume of the cylinder?

15. A square pyramid has a volume of 736 cubic centimeters and one side of the base is 11 centimeters. What is the approximate height of the pyramid?

16. The volume of a cone is 610 cubic centimeters and the height of the cone is 18 centimeters. What is the radius of the cone to the nearest whole number?