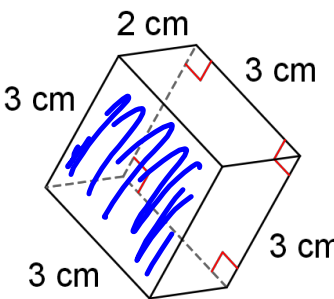
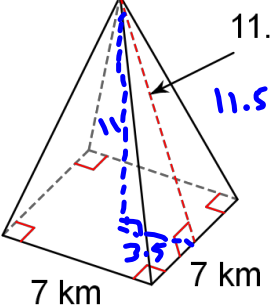


Warm Up:

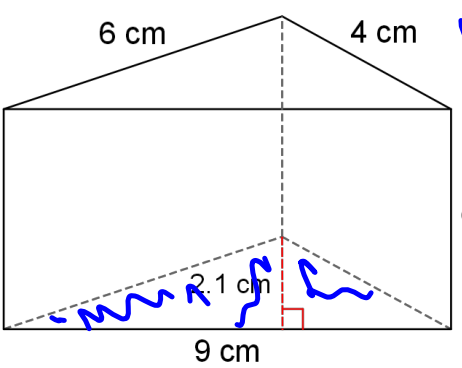
Find the volume of each shape below:

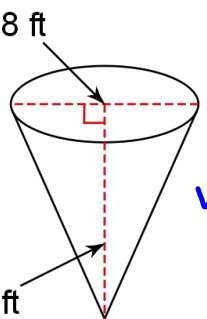
1.  $V = (3)(3)(2)$
 $V = 18 \text{ cm}^3$

2.  $11.5^2 - 3.5^2 = h^2$
 $h = 11$

$B = \frac{1}{2}(9)(2.1)$

$V = \frac{1}{3}(7)(7)(11)$
 $V = 179.7 \text{ km}^3$

3.  $V = 85.1 \text{ cm}^3$

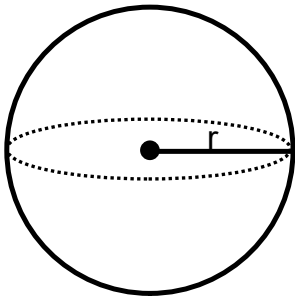
4.  $\frac{1}{3} \pi (4)^2 (10)$
 $53.3 \pi \text{ ft}^3$
 $V = 167.6 \text{ ft}^3$

Learning Goal: Today I will learn how to find the volume of a sphere.

Success Criteria: I am able to use the volume of a sphere to solve problems.

11-6 Volume of Spheres

21

Volume of a Sphere

22

- all points are equidistant from a given point or center

r = radius of sphere

Volume

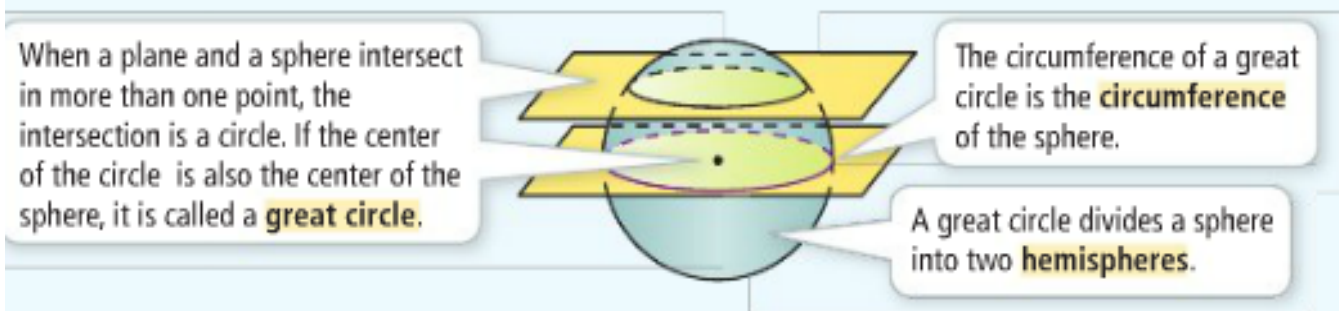
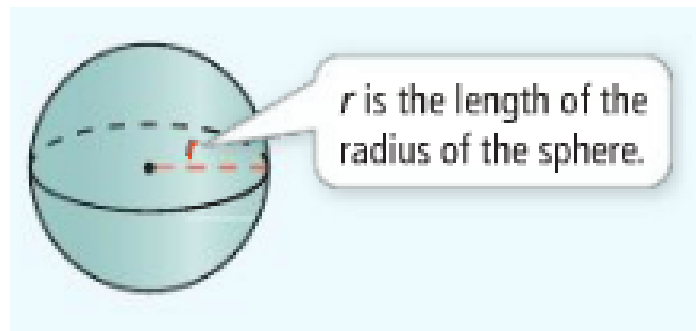
$$V = \frac{4}{3}\pi r^3$$

 \wedge^3

Example:

A sphere has a radius of 5 inches. What is the volume?

$$\left(\frac{4}{3}\right)\pi(5)^3$$
$$523.6 \text{ in}^3$$

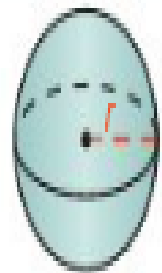


Take note

Theorem 11-11 Volume of a Sphere

The volume of a sphere is four thirds the product of π and the cube of the radius of the sphere.

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



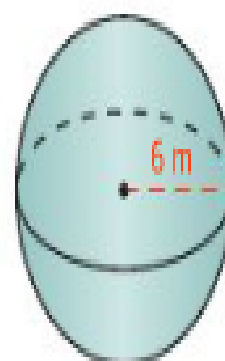
Problem 3 Finding the Volume of a Sphere

What is the volume of the sphere in terms of π ?

$$V = \frac{4}{3}\pi r^3 \quad \text{Use the formula for volume of a sphere.}$$

$$= \frac{4}{3}\pi(6)^3 \quad \text{Substitute.}$$

$$= 288\pi$$



The volume of the sphere is $288\pi \text{ m}^3$.

$$904.8 \text{ m}^3$$

- a. A sphere has a diameter of 60 in. What is its volume to the nearest cubic inch?

$$V = \frac{4}{3}\pi(30)^3 = 36000\pi$$

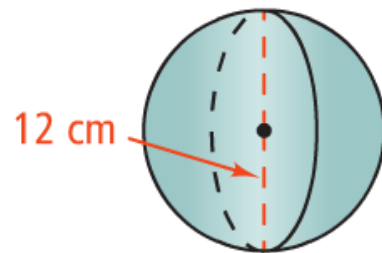
113097.3

- b. **Reasoning** Suppose the radius of a sphere is halved. How does this affect the volume of the sphere? Explain.

Find the volume.

$$V = \frac{4}{3}\pi(6)^3$$

$$V = 904.8 \text{ cm}^3$$



$$C = 30\text{cm}$$

Find the volume

$$C = 2\pi r$$

$$\frac{30}{(2\pi)} = \frac{2\pi r}{2\pi}$$

$$r = 4.8\text{cm}$$

$$V = \frac{4}{3}\pi(4.8)^3$$

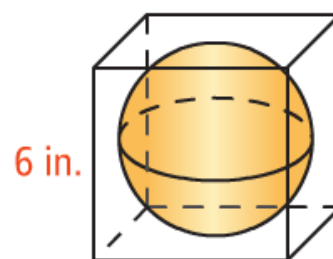
$$V = 463.2\text{cm}^3$$

The sphere at the right fits snugly inside a cube with 6-in. edges. What is the approximate volume of the space between the sphere and cube?

$$V_{\text{cube}} = 6(6)(6) = 216$$

$$V_{\text{sphere}} = \frac{4}{3}\pi(3)^3 = 113.1$$

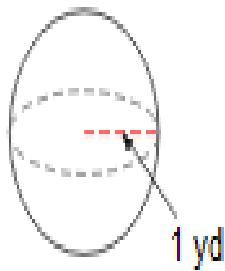
$$216 - 113.1 \\ 102.9 \text{ in}^3$$



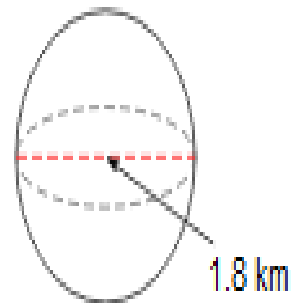
Closure: Today I learned how to find the volume of a sphere.

Find the volume of each figure. Round your answers to the nearest tenth, if necessary

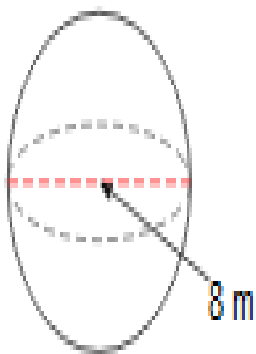
1)

 4.2 yd^3

2)

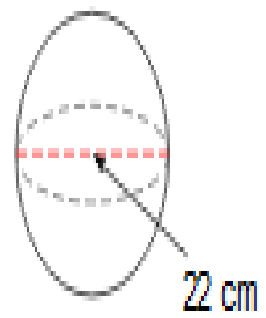
 3.1 km^3

3)



268.1 m³

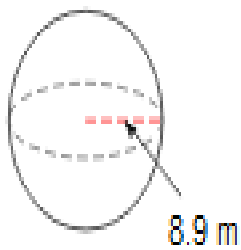
4)



5575.3 cm³

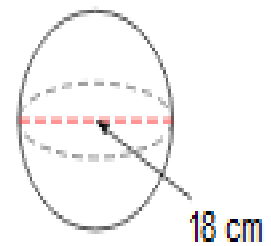
Find the volume of each figure. Round your answers to the nearest hundredth, if necessary. Leave your answers in terms of π for answers that contain π .

5)



$$939.96\pi \text{ m}^3$$

6)



$$972\pi \text{ cm}^3$$

A spherical scoop of ice cream with a diameter of 4 cm rests on top of a sugar cone that is 10 cm deep and has a diameter of 4 cm. If all of the ice cream melts into the cone, what percent of the cone will be filled?



A bowling ball must have a diameter of 8.5 in. If the bowling ball weighs 16 lb, find the density (lb/in.^3) of the bowling ball. Density is the quotient of weight divided by volume. Round your answer to the nearest hundredth.

$$C = 42\text{cm}$$

sphere

What is the volume