April 18, 2016

Today we will find the Surface Area and Volume of Spheres

EQ: What are the formulas for the area and volume of a sphere and how do you prove the formulas?

MCC9–12.G.GMD.1-3
-Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.
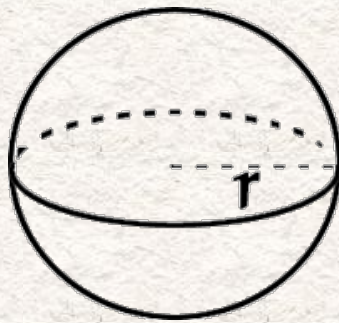
-Use Volume formulas for Cylinders, pyramids, cones and spheres to solve problems.

A <u>sphere</u> is a space figure having all of its points the same distance from its center.

The distance from the center to the surface of the sphere is called its <u>radius</u>.

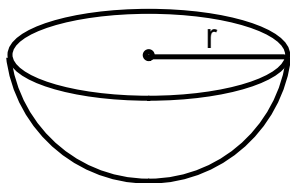Any cross-section of a sphere is a <u>circle</u>.

The largest cross - section is called the <u>great circle</u>.

$$A = 4\pi r^2$$

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

When a sphere is cut in half, the new figure is called a

Hemisphere.

Formulas: $$A = 4\pi r^2$$

A=_____

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

V=_____

Find the surface area and volume of each sphere described below. Round your answer to the nearest tenth.

1. *a sphere with a diameter 10 cm long*

$A = 100\pi$ cm^2 $V = 166.67\pi$ cm^3

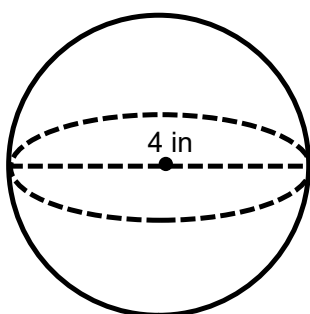2. *a sphere that has a great circle circumference of 83.92 meters*

$83.92 = 2\pi r$ $A = 4\pi 13.35^2 = 712.89\pi$

$2 = 13.35$ $V = 4/3 \pi 13.35^3 = 3172.36\pi$

3. *a sphere with a radius 12 inches long*

$A = 576\pi$ in^2 $V = 2304\pi$ in^3

4.

4 in
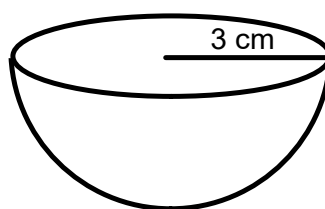
$A = 4\pi 2^2$

$V = 4/3\ \pi\ 2^3$

5

3 cm

$A = 4\pi 3^2$
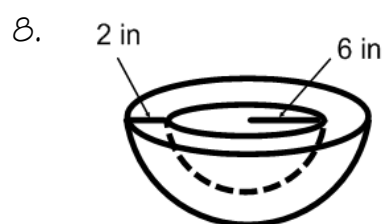
$V = 4/3\ \pi\ 3^3$

6. Find the radius and volume of a sphere with area 200π in^2.

$$200\pi \text{ in}^2 = 4\pi r^2$$

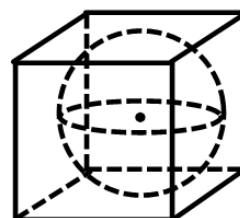7. Find the radius and area of a sphere with volume 288π m^3.

$$288\pi \text{ m}^3 = \frac{4}{3}\pi r^3$$

Hemp thread

8.

2 in   6 in

Area=_____   Volume = _____

9. A sphere fits snuggly inside a cube with an edge that is 6 cm long. What is the volume of the space between the sphere and the cube?

10.   You are bringing a huge spherical birthday balloon to a party. The balloon has a volume of 113.04 ft^3. Will your balloon fit through a doorway that is 5 feet wide? Explain.

Homework:

Worksheet

On-line and textbook help references: p. 581-589
-http://www.mathopenref.com/spherearea.html
- https://www.khanacademy.org/math/basic-geo/basic-geo-volume-surface-area/basic-geo-volumes/v/volume-of-a-sphere
- http://www.youtube.com/watch?v=FmngB6YnqP4

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