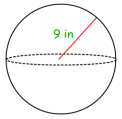
Les 31.3: Surface Area and Volume of Spheres

- A sphere is a set of all the points in space equidistant from a given point. This point is called the center of the sphere.

- A hemisphere is half of a sphere.

[Ex. 1: Find the surface area of a sphere]

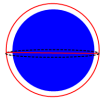
-The surface area of a sphere is 4 x Pi x the radius squared.



Find the surface area of the sphere.

[Ex. 2: Use the circumference of a sphere]

In the diagram, the circumference of the outer ball is 8π feet.
Find the surface area of the outer ball.



[Ex. 3: Find the volume of a sphere]

-The formula for the volume of a sphere is $\frac{4 \text{ x Pi x the radius cubed}}{3}$

A bowling ball has a diameter of 8 inches. Find its volume.

[Ex. 4: Determine the effect of a change in radius]

A spherical balloon has an initial radius of 5 inches. When more air is added to the balloon, the radius is increased to 10 inches. Explain how the surface area and the volume of the balloon change when the radius is doubled. Round your answers to the nearest whole number.

YOUR TURN

1. The diameter of a sphere is 50 feet. Find the surface area and volume of the sphere.

2. Using the diagram for example 2, pretend the circumference of the inner ball is 5π feet. Find the surface area of the inner ball.

3. The original diameter of a sphere is 4 meters. Explain how the surface area and the volume of the sphere change if the diameter is cut in half.