Circles, Cylinders, and Spheres
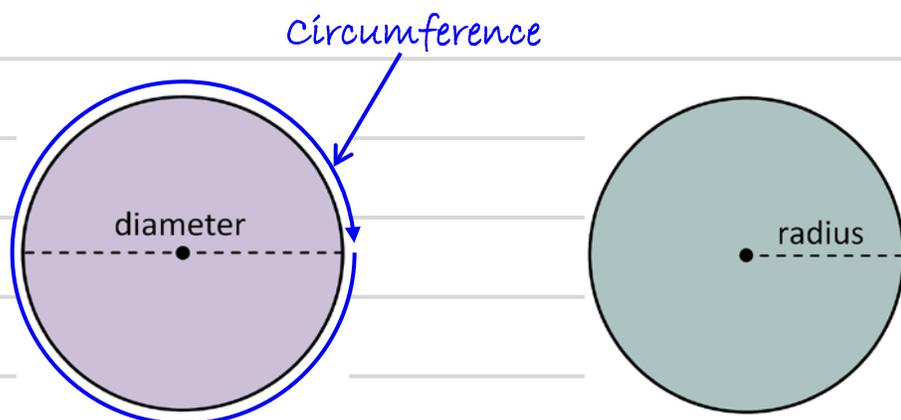
Objective 1 Find the Circumference and Area of a Circle

In math, there are numbers that come up so often, we give them their own symbol. One such special number is pi.

> The symbol for pi is π.

$$\pi \approx 3.14$$

The number π shows up as the ratio of a circle's circumference to its diameter. The circumference is the distance around the circle and the diameter is the distance across the circle through the center. Another dimension we will often mention is the radius of a circle. The radius is half the length of the diameter. This means the diameter is twice the length of the radius.

Circumference

diameter

radius

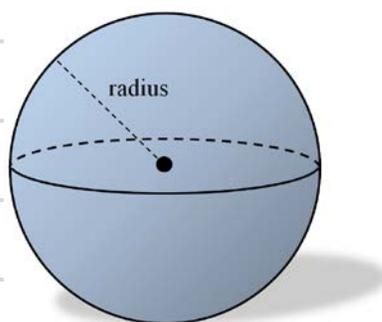The formula for the **circumference** of a circle is
$$C = 2\pi r.$$

The formula for the **area** of a circle is
$$A = \pi r^2.$$

Example 1: Find the circumference and the area of the circle.
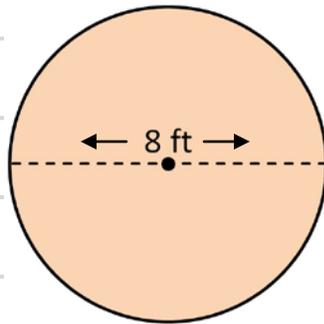
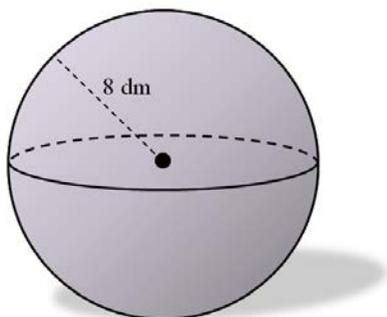**Objective 2** | **Find the Volume of a Sphere**

A **sphere** is a 3-dimensional object like a soccer ball. The radius of a sphere is the distance from the center to the outer edge.
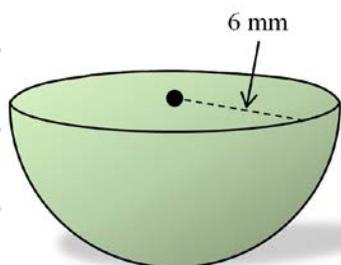
radius

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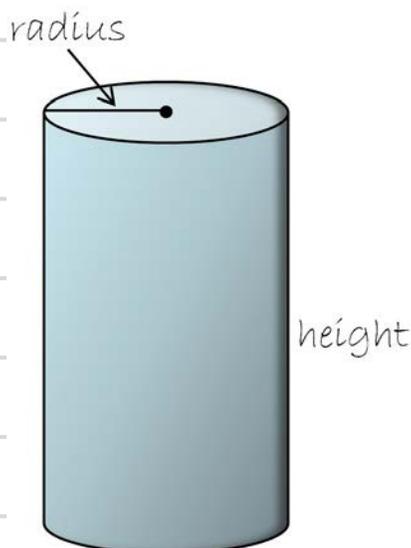$$V = \frac{4}{3}\pi r^3.$$

Example 2: Find the volume of the sphere.

8 dm

Example 3: Find the volume of the hemisphere.

6 mm

Objective 3 | **Find the Volume of a Right Circular Cylinder**

A **right circular cylinder** is a three-dimensional object where the two ends are circles. A soup can is a right circular cylinder with a height of h.

The formula for the volume of a cylinder is $V = \pi r^2 h$.

radius

height

Example 4: Find the volume of the cylinder.

6 ft

20 ft