Key Definitions:
  1. **Volume** – the number of _____ _____ needed to fill a solid.
  2. **Surface Area** – _____ .
  3. **Density** _____ .
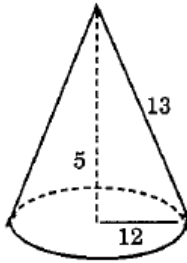
Example 1: The rectangular prism has a length of 7 cm, a width of 5 cm, and a height of 20 cm. What is the volume? What is the surface area?

4 cm

7 cm

5 cm
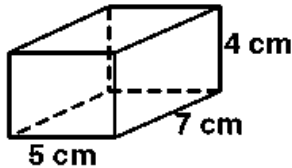
Example 2: The volume of the following soup can is 22π in³, and has a height of 5.5 in. What is the radius of the soup can?

Example 3: Find the volume AND the surface area.


13

5

12

Example 4: The diameter of the earth is approximately 7,926 miles. The diameter of the moon is approximately 2,159 miles. Approximately how many moons would fit inside the earth?

Example 5: A student has a sample of aluminum that has a mass of 27 g and a volume of 10 cm³. What is the density of aluminum?

Now You Try:

1. A rectangular fish tank 60 centimeters by 15 centimeters by 34 centimeters is 1/3 full of water. Find the volume of water needed to fill the tank completely.
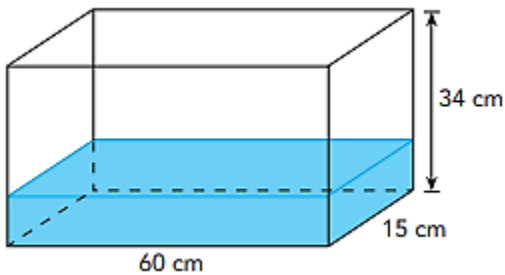
2. You have a lead ball with a mass of 420 g. The density of lead is 10.5 g/cm3. What is the volume of the ball?

Practice:
1. Bob is building a storage shed in a conical shape. The base of the shed is 4 meters in diameter and the height of the shed is 3.6 meters. What is the surface area?

2. A scented candle is in the shape of a cylinder with a radius of 4cm and a height of 12cm. What is the volume?

3. The rectangular prism has a length of 10 inches, a width of 3 inches, and a height of 20 inches. What is the surface area and volume?

4. The height of a cylinder is 10 and the area of a base is 36π square units. What is the volume in cubic units?

5. An above-ground swimming pool in the shape of a cylinder has a diameter of 18 feet and a height of 4.5 feet. The pool is filled with water to 6 inches from the top of the pool. What is the volume, to the nearest cubic foot, of the water in the pool?

6. Find the volume, to the nearest tenth, of a 4 ft by 2 ft by 3 ft rectangular prism with a cylindrical hole, radius 6 in., through the center.
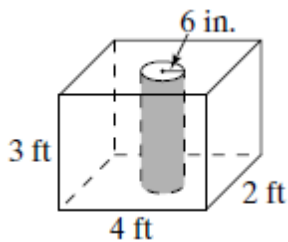
7. A cylindrical can contains an unknown number of golf balls. The can has a height of 12in and a volume of 48π in³. How many golf balls fill the can if they are uniform in size to the container (assuming the radius of the golf balls is the same as the can's radius)?

8. A hockey puck is in the shape of a cylinder and has a volume of 2π in³ and a radius of 2in. How many hockey pucks would be in a stack that reaches a height of 7.5 inches?

9. A solid object was sliced to form two new objects. Each of the two new objects had a circular base. Which shape could **not** have been the original object?

    a. cone

    b. cylinder

    c. prism

    d. sphere

10. A water tank is in the shape of a right circular cylinder with a height of 20 feet and a volume of 320π cubic feet. What is the diameter, in feet, of the water tank?

    a. 16

    b. 10

    c. 8

    d. 4