Lesson 8.4  Finding Volume and Surface Area of Spheres

For this practice, you may use a calculator and use 3.14 as an approximation for π. Round your answers to the nearest tenth if necessary.

Find the volume of each solid sphere.

1. \[ V = \frac{4}{3} \pi r^3 \]
   \[ = \frac{4}{3} (3.14)(4.5^3) \]
   \[ = \frac{4}{3} (3.14)(91.125) \]
   \[ = 361.51 \]
   \[ \approx 361.5 \]

2.\[ V = 3,052.1 \text{ cm}^3 \]
Solve.

3. A puzzle is in the shape of a globe. The diameter of the globe is 7.6 centimeters.
   a) What is the surface area of the globe? 181.4 cm\(^2\)
   b) What is the volume of the globe? 229.7 cm\(^3\)

4. Find the surface area of a sphere with a volume of 2,826 cubic inches.
   \[ r \approx 8.8 \]
   \[ r \approx 8.77205\ldots \]
   \[ SA = 972.6 \text{ in}^2 \]

5. If a marble has a surface area of 2.25\(\pi\) square centimeters, what is the radius of the marble?
   \[ SA = 4\pi r^2 \]
   \[ 2.25\pi = 4\pi r^2 \]
   \[ \frac{2.25\pi}{4\pi} = r^2 \]
   \[ \frac{0.5625}{4} = r^2 \]
   \[ r = 0.75 \]
6. A container is in the shape of a hemisphere. The radius of the container is 12 centimeters. How many liters of liquid can the container hold?

\( V = 3,617.3 \text{ cm}^3 \)

\[ \downarrow \]

3.6 liters
7. Kyle cuts a clay sphere in half to get two hemispheres. He measures the circumference of the hemispheres to be 31.4 inches.
   a) What is the radius of each hemisphere? 5 in.
   b) What is the total surface area of one of the solid hemispheres?

\[
\begin{align*}
SA_{sphere} &= 4\pi r^2 \\
SA_{hemi} &= \pi r^2 + \frac{4\pi r^2}{2} \\
SA_{hemi} &= 3\pi r^2
\end{align*}
\]

\[C = 2\pi r\]

\[235.5 \text{ in}^2\]