Lesson 8.5  Real-World Problems: Composite Solids

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

1. Jack has a marble that has a radius of 0.7 centimeter. He puts together 10 such marbles to form the composite solid shown. What is the volume of the composite solid?

$\approx 14.4 \text{ cm}^3$
2. A composite solid is made up of 2 identical cones joined to a cylinder as shown.

a) What is the total surface area of the composite solid?

b) What is the volume of the composite solid?

\[
\begin{align*}
&1,457.0 \text{ cm}^2 \\
&4,421.1 \text{ cm}^3
\end{align*}
\]
Solve.

3. A trash bin is made up of a hemisphere whose base is attached to the top of a cylinder. The height of the bin is 30 inches and the diameter of the hemisphere is 24 inches. What is the total surface area of the trash bin?

2,713.0 in²
4. A table lamp is made of a cone whose base is mounted on the top of a cylinder as shown. The diameter of the cylinder is 40 centimeters and its height is 10 centimeters. The cone has a slant height of 30 centimeters. What is the total surface area of the lamp?

\[ S = \pi r l \]

\[ S = \pi \times 20 \times 30 \]

\[ S = 600\pi \]

\[ S = 1884 \text{ cm}^2 \]

\[ \text{Base} = 1256 \pi \text{ cm}^2 \]
5. A candle holder is in the shape of a cube with a cylindrical hole through the middle. The edge length of the cube is 5 inches. The diameter of the cylindrical hole is 3 inches and its height is 4 inches.

a) What is the volume of the candle holder?

$$V = 96.74 \text{ in}^3$$

$$V = e^3 - \pi r^2 h$$

b) What is the total surface area of the candle holder?

$$SA = 187.7 \text{ in}^2$$

$$SA = 6(5^2) + 2\pi rh$$

6 full faces + lateral SA of cyl.