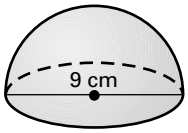
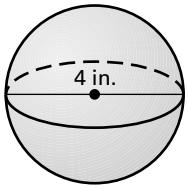
Extra Example 2 Find the Volume of a Sphere

Find the volume of the sphere or hemisphere. Round your answer to the nearest whole number.

a.



b .



SOLUTION

a . A hemisphere has half the volume of a sphere.

$V = \frac{1}{2}(\frac{4}{3}\pi r^3)$ Write the formula for $\frac{1}{2}$ the volume of a sphere.

$= \frac{1}{2} \bullet \frac{4}{3} \cdot \pi \cdot (4.5)^3$ The diameter is 9. Substitute half of 9, or 4.5, for r.

$= \frac{182.25}{3}\pi$ Simplify.

≈ 191 Multiply.

ANSWER ◗ The volume of the hemisphere is about 191 cubic centimeters.

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

$= \frac{4}{3} \cdot \pi \cdot (2)^3$ The diameter is 4. Substitute half of 4, or 2, for r.

$= \frac{32}{3}\pi$ Simplify.

≈ 33 Multiply.

ANSWER ◗ The volume of the sphere is about 33 cubic inches.