Chapter 9 Review

Vocabulary Review

cone (p. 296)
cylinder (p. 296)
polyhedron (p. 296)
prism (p. 296)

pyramid (p. 296)
similar solids (p. 319)
skew lines (p. 297)
solids (p. 296)

sphere (p. 313)
volume (p. 301)

Choose the correct vocabulary term above to complete each sentence.

1. The ? of an object is the number of cubic units in the object.

2. A(n) ? has one base and one vertex, but it is not a polyhedron.

3. Both a(n) ? and a(n) ? have two parallel, congruent bases.

4. The set of all points in space that are the same distance from a center point is a ? .

5. Two solids are ? if they have the same shape and if all of their corresponding dimensions are proportional.

Lesson 9-1

• To identify solids, parts of solids, and skew line segments

Solids are any objects that have a length, a width, and a height. If all the faces of a solid are polygons, the figure is a **polyhedron**. **Prisms** and **pyramids** are polyhedrons. **Cylinders** and **cones** are not polyhedrons.

For each solid, describe the shape of the base(s) and the lateral surface(s).

6. rectangular prism

7. square pyramid

8. cylinder

Lesson 9-2

- To find the volumes of prisms and cylinders

Volume V is the number of cubic units in a solid. For a prism and a cylinder, the volume is the product of the area of the base B and the height h between the two bases of the solid.

Volume formula for prisms and cylinders $V = Bh$

Find the volume to the nearest whole number. 10–11. See margin.

9.
10 m
2 m
8 m

10.
5 cm   10 cm

11.
13 in.
13 in.
13 in.
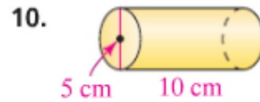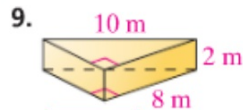
10.
11.

12. A quarter has the shape of a cylinder with a diameter of 24.26 mm and height of 1.75 mm. To the nearest cubic millimeter, what is the volume of metal used to produce each coin?
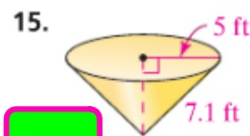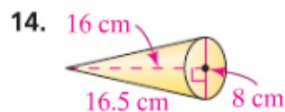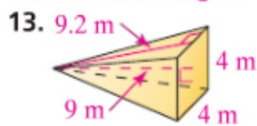
Lesson 9-3

- To find the volumes of pyramids and cones

For a pyramid and a cone, the volume is one third the product of the area of the base B and the height h of the solid. A pyramid is one third the volume of a prism with the same dimensions. The volume of a cone is one third the volume of a cylinder with the same dimensions.

Volume formula for pyramids and cones $V = \frac{1}{3}Bh$

Find the volume to the nearest whole number.
13–14. See margin.

13. 9.2 m
4 m
9 m   4 m

14. 16 cm
16.5 cm   8 cm

15.
5 ft
7.1 ft

13.
14.

16. A glass pyramid constructed outside the Louvre Museum in Paris has a square base of 35 m and a height of 20.6 m. To the nearest cubic meter, what is the volume of this pyramid?

A **sphere** is the set of all points in space that are the same distance from a center point. The formula for the surface area of a sphere is $S.A. = 4\pi r^2$. The formula for volume is $V = \frac{4}{3}\pi r^3$.
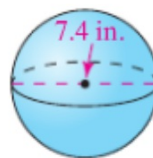
Find each sphere's surface area and volume to the nearest whole number.
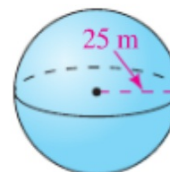17–19. See left.

17.
6 cm

18.
7.4 in.

19.
25 m

17. [____] ; [____]
18. [____] ; [____]
19. [____] ; [____]

20. [____]
[____]

20. The earth has a diameter of about 13,000 km. Estimate the earth's surface area and volume. **See left.**

Similar solids have the same shape and proportional corresponding dimensions. If the ratio of their corresponding dimensions is $\frac{a}{b}$, the ratio of their surface areas is $\frac{a^2}{b^2}$, and the ratio of their volumes is $\frac{a^3}{b^3}$.
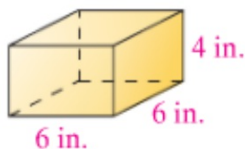
For each solid, find the surface area and volume of a similar solid whose dimensions are $\frac{4}{5}$ of those given. Round to the nearest whole number.
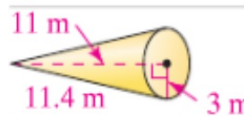21–23. See margin.

21. [____] ; [____]
22. [____] ; [____]
23. [____] [____]

21.
9 yd
20 yd

22.
4 in.
6 in.
6 in.

23.
11 m
11.4 m
3 m