

# Practice

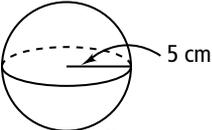
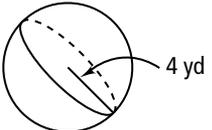
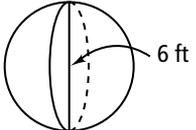
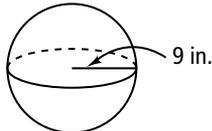
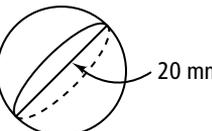
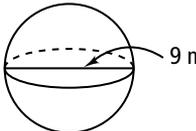
Form G

## Surface Areas and Volumes of Spheres

Find the surface area of the sphere with the given diameter or radius. Leave your answer in terms of  $\pi$ .

1.  $d = 8$  ft  $64\pi$  ft<sup>2</sup>                      2.  $r = 10$  cm  $400\pi$  cm<sup>2</sup>  
 3.  $d = 14$  in.  $196\pi$  in.<sup>2</sup>                      4.  $r = 3$  yd  $36\pi$  yd<sup>2</sup>

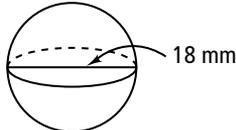
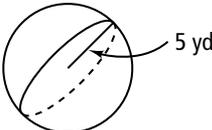
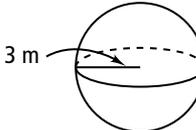
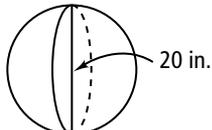
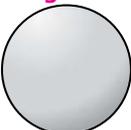
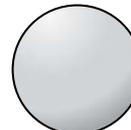
Find the surface area of each sphere. Leave each answer in terms of  $\pi$ .

5.   $100\pi$  cm<sup>2</sup>                      6.   $64\pi$  yd<sup>2</sup>                      7.   $36\pi$  ft<sup>2</sup>  
 8.   $324\pi$  in.<sup>2</sup>                      9.   $400\pi$  mm<sup>2</sup>                      10.   $81\pi$  m<sup>2</sup>

Use the given circumference to find the surface area of each spherical object. Round your answer to the nearest whole number.

11. an asteroid with  $C = 83.92$  m  $2242$  m<sup>2</sup>                      12. a meteorite with  $C = 26.062$  yd  $216$  yd<sup>2</sup>  
 13. a rock with  $C = 16.328$  ft  $85$  ft<sup>2</sup>                      14. an orange with  $C = 50.24$  mm  $803$  mm<sup>2</sup>

Find the volume of each sphere. Give each answer in terms of  $\pi$  and rounded to the nearest cubic unit.

15.   $972\pi$  mm<sup>3</sup>;  $3054$  mm<sup>3</sup>                      16.   $166\frac{2}{3}\pi$  yd<sup>3</sup>;  $524$  yd<sup>3</sup>                      17.   $36\pi$  m<sup>3</sup>;  $113$  m<sup>3</sup>  
 18.   $1333\frac{1}{3}\pi$  in.<sup>3</sup>;  $4189$  in.<sup>3</sup>                      19.   $10\frac{2}{3}\pi$  cm<sup>3</sup>;  $34$  cm<sup>3</sup>                      20.   $85\frac{1}{3}\pi$  cm<sup>3</sup>;  $268$  cm<sup>3</sup>

A sphere has the volume given. Find its surface area to the nearest whole number.

21.  $V = 1200$  ft<sup>3</sup>  $546$  ft<sup>2</sup>                      22.  $V = 750$  m<sup>3</sup>  $399$  m<sup>2</sup>                      23.  $V = 4500$  cm<sup>3</sup>  $1318$  cm<sup>2</sup>

**Practice** (continued)

Form G

## Surface Areas and Volumes of Spheres

Find the volume in terms of  $\pi$  of each sphere with the given surface area.

24.  $900\pi \text{ in.}^2$   **$4500\pi \text{ in.}^3$**       25.  $81\pi \text{ in.}^2$   **$121.5\pi \text{ in.}^3$**       26.  $6084\pi \text{ m}^2$   **$79,092\pi \text{ m}^3$**

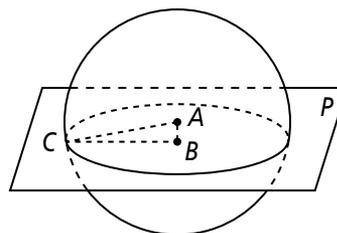
27. The difference between drizzle and rain has to do with the size of the drops, not how much water is actually falling from the sky. If rain consists of drops larger than 0.02 in. in diameter, and drizzle consists of drops less than 0.02 in. in diameter, what can you say about the surface area and volume of rain and drizzle?

rain: S.A.  $> 0.0013 \text{ in.}^2$ ,  $V > 0.000004 \text{ in.}^3$ ; drizzle: S.A.  $< 0.0013 \text{ in.}^2$ ,  $V < 0.000004 \text{ in.}^3$ 

28. A spherical scoop of ice cream with a diameter of 4 cm rests on top of a sugar cone that is 10 cm deep and has a diameter of 4 cm. If all of the ice cream melts into the cone, what percent of the cone will be filled? **80%**



29. Point  $A$  is the center of the sphere. Point  $C$  is on the surface of the sphere. Point  $B$  is the center of the circle that lies in plane  $P$  and includes point  $C$ . The radius of the circle is 12 mm.  $AB = 5$  mm. What is the volume of the sphere to the nearest cubic mm?  **$9203 \text{ mm}^3$**



30. **Writing** What are the formulas for the volumes of a sphere, a cone with a height equal to its radius, and a cylinder with its height equal to its radius? How are these formulas related?  
**Sphere:  $V = \frac{4}{3}\pi r^3$ ; cone:  $V = \frac{1}{3}\pi r^3$ ; cylinder:  $V = \pi r^3$ ; the volume of a sphere is equal to the sum of the volume of a cone and a cylinder with height equal to their radii.**
31. Candlepin bowling balls have no holes in them and are smaller than the bowling balls used in tenpin bowling. The regulation size is 4.5 in. in diameter, and their density is  $0.05 \text{ lb/in.}^3$ . What is the regulation weight of a candlepin bowling ball? Round your answer to the nearest tenth of a pound. **2.4 lb**
32. Find the radius of a sphere such that the ratio of the surface area in square inches to the volume in cubic inches is 4 : 1. **0.75 in.**
33. Find the radius of a sphere such that the ratio of the surface area in square feet to the volume in cubic feet is 2 : 5. **7.5 ft or 7 ft 6 in.**