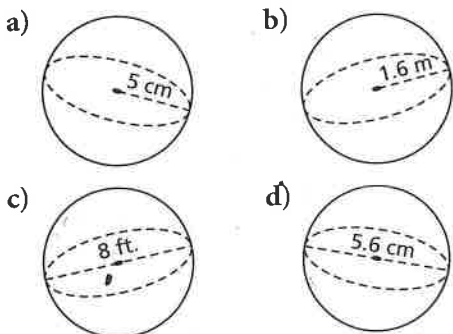


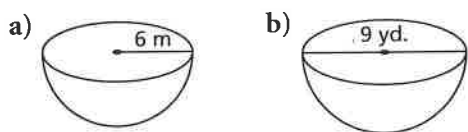
# Exercises

## A

3. Determine the surface area of each sphere to the nearest square unit.



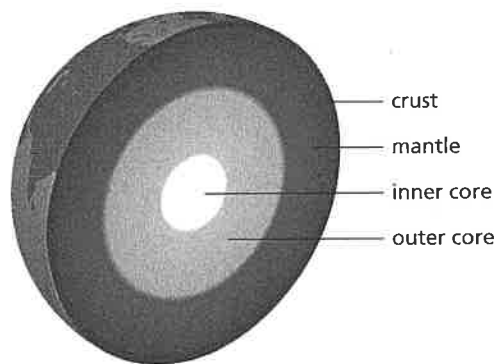
4. Determine the volume of each sphere in question 3 to the nearest cubic unit.
5. Determine the surface area and volume of each hemisphere. Write your answers to the nearest whole unit.



## B

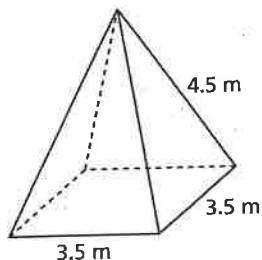
6. Use a marble or other sphere. Measure its diameter. Calculate its volume and surface area.
7. A sphere has a radius of 8.4 m. Determine its surface area and volume to the nearest tenth of a unit.
8. The surface area of a tennis ball is approximately  $127 \text{ cm}^2$ . What is the radius of the tennis ball to the nearest tenth of a centimetre?
9. A sphere has a surface area of 452 square inches. What is the diameter of the sphere to the nearest inch?
10. A glass bowl approximates a hemisphere with diameter 20 cm.
- What is the capacity of the bowl to the nearest tenth of a litre? ( $1000 \text{ cm}^3 = 1 \text{ L}$ )
  - One cup is 250 mL. How many cups of punch can the bowl hold?

11. A sphere has a diameter of 12 cm. A hemisphere has a radius of 8 cm.
- Which object has the greater surface area?
  - Which object has the greater volume?
12. The gas storage sphere on page 45 has diameter 15.8 m.
- What is the surface area of the sphere to the nearest square metre?
  - What is the capacity of the sphere to the nearest kilolitre? ( $1 \text{ kL} = 1 \text{ m}^3$ )
13. Earth approximates a sphere but its diameter varies. The mean diameter of Earth is approximately 12 756 km.
- Determine the surface area of Earth to the nearest square kilometre.
  - About 70% of Earth's surface is covered in water. What is this area in square kilometres?
  - Determine the volume of Earth to the nearest thousand cubic kilometres.
  - The inner core of Earth has a radius of approximately 1278 km. Determine, to the nearest thousand cubic kilometres, the volume of Earth that is *not* part of the inner core.



14. The diameter of Earth through the North and South poles is 16 km less than its mean diameter, approximately 12 756 km. The diameter of Earth at the equator is 26 km greater than its mean diameter. Determine the approximate volume of Earth using the polar radius and equatorial radius.

15. a)



- b) 3.8 m                      c) 15.3 m<sup>3</sup>  
 16. 401 ft.<sup>3</sup>  
 17. a) 15 cm<sup>2</sup>                      b) 23 cm<sup>3</sup>  
 c) No, there is also some air inside the tea bag.  
 18. a) 4.7 cm                      b) 10.5 m  
 c) 3.3 m                      d) 7.4 cm  
 19. b) 8.0 cm  
 20. a) 22.9 kL                      b) Approximately 8.3 kL  
 21. 10 yd.  
 22. 49.6 m<sup>3</sup>

1.6 Surface Area and Volume of a Sphere, page 51

3. a) 314 cm<sup>2</sup>                      b) 32 m<sup>2</sup>  
 c) 201 ft.<sup>2</sup>                      d) 99 cm<sup>2</sup>  
 4. a) 524 cm<sup>3</sup>                      b) 17 m<sup>3</sup>  
 c) 268 ft.<sup>3</sup>                      d) 92 cm<sup>3</sup>  
 5. a) 339 m<sup>2</sup>, 452 m<sup>3</sup>                      b) 191 yd.<sup>2</sup>, 191 yd.<sup>3</sup>  
 7. 886.7 m, 2482.7 m<sup>3</sup>  
 8. 3.2 cm  
 9. 12 in.  
 10. a) 2.1 L                      b) 8 cups  
 11. a) Hemisphere                      b) Hemisphere  
 12. a) 784 m<sup>2</sup>                      b) 2065 kL  
 13. a) 511 185 933 km<sup>2</sup>  
 b) 357 830 153 km<sup>2</sup>  
 c) 1 086 781 293 000 km<sup>3</sup>  
 d) 1 078 037 876 000 km<sup>3</sup>  
 14. Approximately 1 082 696 932 000 km<sup>3</sup>;  
 approximately 1 093 440 264 000 km<sup>3</sup>  
 15. 239 spheres  
 16. a) 11 cm; 5 in.                      b) 1387 cm<sup>2</sup>; 277 in.<sup>2</sup>  
 c) 4855 cm<sup>3</sup>; 434 in.<sup>3</sup>                      d) Basketball  
 17. a) 16.4 m<sup>3</sup>                      b) 1.0 m<sup>2</sup>  
 18. 529.6 m<sup>2</sup>; 882.2 m<sup>3</sup>  
 19. 42 pumps  
 20. 45 cookies

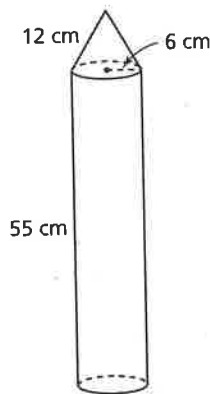
21. a) Approximately 69%  
 b) Assumptions: Ball is created from one solid piece and has greatest possible diameter.  
 22.  $SA = \pi d^2$ ;  $V = \frac{1}{6} \pi d^3$   
 23. Approximately 5 in.  
 24. a) Inflated balloon's circumference is 3 times as great  
 b) Inflated balloon's surface area is 9 times as great  
 c) Inflated balloon's volume is 27 times as great

Chapter 1: Checkpoint 2, page 54

1. a) 80 ft.<sup>2</sup>                      b) 21 m<sup>2</sup>  
 c) 1127 m<sup>2</sup>  
 2. 425 m<sup>2</sup>  
 3. 183 in.<sup>2</sup>  
 4. a) 41 ft.<sup>3</sup>                      b) 6 m<sup>3</sup>  
 c) 1947 m<sup>3</sup>  
 5. a) 9.5 cm                      b) 2.7 m  
 c) 17.4 cm  
 6. a) 973.1 km<sup>2</sup>, 2854.5 km<sup>3</sup>  
 b) 109.0 cm<sup>2</sup>, 82.3 cm<sup>3</sup>  
 7. 7946 cm<sup>2</sup>

1.7 Solving Problems Involving Objects, page 59

3. a) 170 cm<sup>2</sup>                      b) 1040 ft.<sup>2</sup>  
 c) 95 in.<sup>2</sup>                      d) 314 in.<sup>2</sup>  
 4. a) Object in part c                      b) Approximately 38 in.<sup>3</sup>  
 5. a) 273.3 cm<sup>2</sup>, 353.4 cm<sup>3</sup>                      b) 12.0 m<sup>2</sup>, 2.5 m<sup>3</sup>  
 6. a)  $5\frac{4}{5}$  in.                      b) 6.7 cm  
 7. a)



- b) 2413 cm<sup>2</sup>                      c) 6612 cm<sup>3</sup>  
 d) Approximately 2204 cm<sup>3</sup>, or 2204 mL