**9.** 3234.9065 cm$^3$

**10. a)** P6 Truss solar array; volume: 6578.82438 m$^3$.
**b)** Estimate of the total volume is 7000 m$^3$. Total volume: 7209.078115 m$^3$

**11.** 3.925 m$^3$

**12.** Martha should buy the "Popcorn Lover's' container because it has a larger volume. The volume of the "Jumbo" popcorn container is 12 560 cm$^3$. The volume of the "Popcorn Lover's" container is 14 130 cm$^3$.

**13.** 5 m$^3$

**14.** 251.2 m$^3$

**15. a)** The volume of the cylinder is four times as large. The volume of the cylinder is calculated using the formula $V = (\pi \times r^2) \times h$. If the radius is doubled, the formula will be $V = (\pi \times (2r)^2) \times h$
$$V = (\pi \times 4r^2) \times h$$
$$V = 4(\pi \times r^2) \times h$$
**b)** The volume of the cylinder is twice as large. The volume of the cylinder is calculated using the formula $V = (\pi \times r^2) \times h$. If the height is doubled, the formula will be $V = (\pi \times r^2) \times 2h$
$$V = 2(\pi \times r^2) \times h$$

**16.** 1695.6 cm$^3$; Assume that one quarter of the block of cheese was cut away.

**17. a)** 1.884 m$^3$ **b)** 0.4 m$^3$ **c)** 0.628 m$^3$

**18.** 7 h

### 7.4 Solving Problems Involving Prisms and Cylinders, pages 273–275

**3. a)** To build a giant prism with a triangular base of length 5.6 m and height 6.8 m requires four prisms on the bottom layer. $4 + 3 + 3 + 2 + 2 + 1 + 1 = 16$ The artist would need 16 small prisms to build the large prism. With 20 prisms, he has enough. **b)** 22.47 m$^3$

**4.** 46.9 cm

**5.** 2.826 m$^3$

**6.** 2.0 cm$^3$

**7.** 48 937.5 cm$^3$

**8.** One crate will be enough. The volume of the crate is 63 m$^3$ and the volume of the 25 000 boxes is 50 m$^3$.

**9.** All of the files will fit in the carton. The volume of the carton is 72 000 000 cm$^3$ and the volume of 9000 boxes is 70 200 000 cm$^3$.

**10. a)** 372 875 cm$^3$ **b)** 1 864 375 cm$^3$ **c)** To reach this goal the garbage can should be 0.5 full on each lunch hour on each of the five school days.

**11.** 60 cm

**12.** 91 pails

**13.** 27 prisms

**14.** $12.78 per jar

**15. a)** 1300 cm$^3$ **b)** You can check your calculations by dividing the shape into a different set of rectangular prisms.

**16. a)** 203 472 cm$^3$ **b)** 13 200 cm$^3$ **c)** 15.4 pails

**17.** Answers may vary. Example: Rolling the cylinder so that the circumference is 28 cm and the height is 22 cm will produce the larger volume. The cylinder with a circumference of 22 cm and a height of 28 cm has a

volume of 1077 cm$^3$. The cylinder with a circumference of 28 cm and a height of 22 cm has a volume of 1373 cm$^3$.

**18.** 5 cm

**19.** 6280 cm$^3$

**20.** 2.5 m

**21. a)** 149 250 m$^3$ **b)** 4 h and 9 min

### Chapter Review, pages 276–277

**1.** B **2.** D **3.** A **4.** C

**5. a)** 84 cm$^3$ **b)** 14 080 cm$^3$ **c)** 81 cm$^3$

**6. a)** 24 cm$^3$ **b)** 40 cm$^3$ **c)** 150 cm$^3$

**7.** 196 cm$^3$

**8. a)** 168 cm$^3$ **b)** 2250 cm$^3$

**9. a)** 1000 cm$^3$ **b)** 614.125 cm$^3$

**10. a)** 120 cm$^3$ **b)** 70 cm$^3$

**11. a)** 100 cm$^3$ **b)** 14 400 mm$^3$

**12.** 0.6 m$^3$

**13. a)** 55 080 m$^3$ **b)** 1311.4 truck loads **c)** 11 days

**14. a)** 125 600 cm$^3$ **b)** 327 910.2 m$^3$

**15. a)** 2317.32 cm$^3$ **c)** 4578.12 cm$^3$

**16.** 141.3 m$^3$

**17.** 76.93 m$^3$ or 77 m$^3$

**18.** 301.3 mm$^3$

**19.** 8.79 m

**20. a)** volume of water: 0.9375 m$^3$
**b)** length of time: 1 min 34 s

## Chapter 8

### 8.1 Exploring Integer Multiplication, pages 291–292

**5. a)** $(+5) \times (+1)$ **b)** $(+2) \times (-6)$

**6. a)** $(+3) \times (+7)$ **b)** $(+4) \times (-4)$

**7. a)** $(+8) + (+8) + (+8)$
**b)** $(-6) + (-6) + (-6) + (-6) + (-6)$

**8. a)** $(+2) + (+2) + (+2) + (+2) + (+2) + (+2)$
**b)** $(-9) + (-9) + (-9) + (-9)$

**9. a)** $(+2) \times (+4)$ **b)** $(+4) \times (-2)$

**10. a)** $(+7) \times (+2)$ **b)** $(+6) \times (-1)$

**11. a)** $(-3) \times (-2)$ **b)** $(-3) \times (+3)$

**12. a)** $(-1) \times (+7)$ **b)** $(-2) \times (-5)$

**13. a)** $(+4) \times (+6) = 24$ **b)** $(+7) \times (-2) = -14$
**c)** $(-1) \times (+5) = -5$ **d)** $(-8) \times (-2) = 16$

**14. a)** $(+6) \times (+2) = 12$; The temperature increased 12 °C in 6 h. **b)** $(+4) \times (+8) = 32$; Ayesha repaid a total of $32.

**15.** $(+12) \times (-3) = -36$; The aircraft descends 36 m.

**16. a)** 40 m **b)** 12 m

**17.** 16 m

**18.** No. Doubling a negative integer results in an integer of lesser value.

**19. a)** 3 **b)** Yes; $-6$ **c)** The easiest solution is to multiply each integer in part a) by $-4$. Many other solutions are possible. Example:

| $-4$ | $-22$ | 14 |
|------|-------|-----|
| $-4$ | 4 | $-12$ |
| $-4$ | 6 | $-14$ |