

## Answers for 1.1

For use with pages 5–7

### 1.1 Skill Practice

- exponent: 12, base: 6
- Substitute 3 for  $n$ . Then write  $3^5$  as the product  $3 \cdot 3 \cdot 3 \cdot 3 \cdot 3$  and multiply; 243.
- 60
- 2.4
- 12
- 0.4
- 12
- 4.5
- 3
- 0.9
- 10
- $\frac{1}{3}$
- $\frac{1}{3}$
- $1\frac{2}{3}$
- D
- twelve to the fifth power,  
 $12 \cdot 12 \cdot 12 \cdot 12 \cdot 12$
- seven to the third power,  $7 \cdot 7 \cdot 7$
- three and two tenths squared,  
 $3.2 \cdot 3.2$
- three tenths to the fourth power,  
 $0.3 \cdot 0.3 \cdot 0.3 \cdot 0.3$
- one half to the eighth power,  
 $\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2}$
- $n$  to the seventh power,  
 $n \cdot n \cdot n \cdot n \cdot n \cdot n \cdot n$
- $y$  to the sixth power,  
 $y \cdot y \cdot y \cdot y \cdot y \cdot y$
- $t$  to the fourth power,  $t \cdot t \cdot t \cdot t$
- 0.4 was multiplied by 2 instead of squared;  
 $(0.4)^2 = (0.4)(0.4) = 0.16$ .
- The base was used as the exponent and the exponent was used as the base;  
 $5^4 = 5 \cdot 5 \cdot 5 \cdot 5 = 625$ .
- 9
- 100
- 1
- 1331
- 125
- 243
- 64
- 1296
- $\frac{1}{16}$
- $\frac{27}{125}$
- $\frac{16}{81}$
- $\frac{1}{216}$
- $\frac{9}{16}$
- 1.21
- 17.4
- 40.5
- 6.7
- 9.6
- C
- B
- $3^y$ ; if  $y > x$ , then  $3^y$  is raised to a higher power than  $3^x$ .
- $3$ ;  $3^2 = 9$  and  $2^3 = 8$ . For values of  $x$  greater than 3,  $2^x > x^2$ .

### 1.1 Problem Solving

- 30 m
- 162.5 cm
- a. 240 points
- 260 points
- a. 12 in.
- 144 in.<sup>2</sup>
- C
- New England Patriots

**Answers for 1.1** *continued*  
For use with pages 5–7

- 54. a.**  $216 \text{ in.}^3$ ;  $1728 \text{ in.}^3$ ;  $5832 \text{ in.}^3$   
**b.** 2; 8                      **c.** 3; 27
- d.** *Sample answer:* The volume of the cube is multiplied by  $n^3$ . The edge length of Bin B is 2 times the edge length of Bin A, so the volume of Bin B is  $2^3$  or 8 times the volume of Bin A. The edge length of Bin C is 3 times the edge length of Bin A, so the volume of Bin C is  $3^3$  or 27 times the volume of Bin A.
- 55.** 4 cubes; about  $0.1953 \text{ in.}^3$

**1.1 Mixed Review**

- 56.**  $\frac{11}{16}$               **57.**  $1\frac{1}{12}$               **58.**  $\frac{4}{9}$
- 59.**  $\frac{6}{25}$                       **60.**  $0.37, \frac{37}{100}$
- 61.**  $0.15, \frac{3}{20}$               **62.**  $1.25, 1\frac{1}{4}$
- 63.**  $0.002, \frac{1}{500}$               **64.** 25.2 m
- 65.** 56 in.

## Answers for 1.2

For use with pages 10–12

### 1.2 Skill Practice

- Square 4.
- Substitute 3 for  $x$ ; multiply  $3 \cdot 3$ ; add  $9 + 1$ ; square 10; multiply  $2 \cdot 100$ . The result is 200.
- 8
- 4
- 14
- 47
- $3\frac{3}{5}$
- 82
- $63\frac{3}{4}$
- 16
- 21
- 40
- 73.5
- 1
- $12\frac{1}{2}$
- 0
- 48
- 32
- A
- $7 + 7$  was added before dividing 14 by 7;  
 $(1 + 13) \div 7 + 7 = 14 \div 7 + 7$   
 $= 2 + 7 = 9$ .
- $\frac{1}{2}$  was multiplied by 6 before squaring 6;  
 $20 - \frac{1}{2} \cdot 6^2 = 20 - \frac{1}{2} \cdot 36$   
 $= 20 - 18 = 2$ .
- 16
- 29
- 11
- 126
- 15
- 0.75
- $3\frac{1}{22}$
- 3
- $\frac{1}{4}$
- B

32.  $(9 + 39 + 22) \div (11 - 9 + 3)$

33.  $(2 \times 2 + 3)^2 - (4 + 3) \times 5$

### 1.2 Problem Solving

34. \$6.05

35. a. \$22.87      b. \$2.13

36. a. 65 in.      b. 68 in.

37. *Sample answer:*  $(3 \times 4) + 5$

38. \$14.99

39. a. \$380, \$237.99; \$142.01

- b. *Sample answer:* You could write an expression showing the difference of your income and expenses as  
 $P = 10s - (4.50m + 12.99)$ .

40. a. *Sample answer:* First place votes are worth 3 points which is  $3f$ , second place votes are worth 2 points which is  $2s$ , third place votes are worth 1 point which is  $1t$ . A player's point total is  $3f + 2s + t$ .

- b. 128 points

- c. Yes. *Sample answer:* Change each of the first place votes to third place votes, change each of the second place votes to first place votes, and change each of the third place votes to second place votes.

**Answers for 1.2** *continued*  
For use with pages 10–12

**1.2 Mixed Review**

**41.** 30      **42.** 0.25      **43.** 1152

**44.** 80,000      **45.** 9.7      **46.** 14.3

**47.**  $2\frac{1}{2}$       **48.**  $4\frac{1}{4}$       **49.** 36

**50.** 10,000      **51.** 0.04      **52.**  $\frac{8}{27}$

## Answers for 1.3

For use with pages 18–20

### 1.3 Skill Practice

1. rate
2. Divide the numerator and the denominator by 4;  
$$\frac{20 \text{ miles} \div 4}{4 \text{ hours} \div 4} = \frac{5 \text{ mi}}{1 \text{ h}}$$
 or 5 mi/h.
3.  $x + 8$
4.  $6y$
5.  $\frac{1}{2}m$
6.  $\frac{50}{h}$
7.  $7 - n$
8.  $15 + x$
9.  $\frac{2t}{12}$
10.  $p^2 - 3$
11.  $2k - 7$
12.  $3w + 5$
13. C
14. C
15.  $4v$
16.  $5 - p$
17.  $\frac{16}{p}$
18.  $20 + j$
19.  $7 - d$
20.  $\frac{m}{60}$
21.  $12y$
22. 8 students per group
23. 1.5 pints per serving
24. 2.4 runs per inning
25. \$6.80 per share
26. Feet should cancel out, not be squared; \$48.
27. Feet should cancel out; \$54.
28.  $1\frac{3}{16}$  mi in 1 min 55 sec
29. \$19.50 for 1 h
30.  $\frac{n \cdot (n + 1)}{2}$ ; 1275

### 1.3 Problem Solving

31.  $19.95t + 3$ ; \$102.75
32. 98g; 1960 tons
33. a. \$.055; \$.06  
b. 48 oz container  
c. \$.96
34. *Sample answer:* You earn 30 dollars for shoveling driveways in a certain amount of time. If  $x = 4$  hours, the unit rate is \$7.50 per hour.
35. \$500
36.  $36s + 60l$ ; 732 sec
37. a.  $12g + h + \frac{1}{4}c$   
b. 247; 376.75; 242  
c. Girth; because it is multiplied by 12.

### 1.3 Mixed Review

38.  $60 \text{ in.}^2$
39.  $7 \text{ cm}^2$
40.  $3.15 \text{ m}^2$
41. 90
42. 16
43. 16
44. 7
45. 3
46. 6.5

## Answers for 1.4

For use with pages 24–27

### 1.4 Skill Practice

1. *Sample answer:*  $3x + 5 = 20$
2. An expression does not contain an equal sign but an equation does.
3.  $42 + n = 51$     4.  $z - 11 = 35$
5.  $9 - \frac{t}{6} = 5$     6.  $12 + 8k = 48$
7.  $9(t + 5) < 6$     8.  $4w \leq 51$
9.  $8 < b + 3 < 12$
10.  $4 < 8k \leq 16$
11.  $10 < t - 7 < 20$
12.  $p \leq \$10$     13.  $p \geq \$12.99$
14. The wrong inequality symbol is used;  $n + 4 \leq 13$ .
15. The wrong inequality symbol is used;  $\frac{t}{4.2} \leq 15$ .
16. D    17. solution
18. not a solution
19. not a solution
20. solution    21. not a solution
22. not a solution
23. solution
24. solution    25. solution
26. not a solution
27. not a solution

28. not a solution
29. 5    30. 9    31. 12
32. 4    33. 9    34. 24
35.  $3x - 2 = x + 5$ ; solution
36.  $2k + 4 \leq k + 11$ ; solution
37. C
38. Ask what number times 3 plus 4 equals 19.

### 1.4 Problem Solving

39. 7.5 mi
40.  $27 + c \leq 40$ ; no
41. 167 h
42. No. *Sample answer:* Since each batch of cookies takes 2.5 cups of flour and you want to make 8 batches, you need to multiply 2.5 by 8, which gives you 20 cups. Since you only have 18 cups, you do not have enough.
43. \$100
44. *Sample answer:* You want to buy \$5 gift certificates to a music store for your friends. If you have \$50, how many certificates can you buy? 10 certificates; you can buy 10 \$5 gift certificates for \$50.

**Answers for 1.4** *continued*  
For use with pages 24–27

- 45. a.**  $6r + 5(10 - r) \geq 55$   
**b.** Yes; you will earn \$30 running errands and \$25 walking dogs;  $30 + 25 = 55$ .  
**c.** Yes; if you work 10 hours running errands, you will earn \$60. You will not meet your goal if you work all 10 hours walking dogs.
- 46. a.** 60 tickets  
**b.** 160 tickets  
**c.** Yes; \$400; if they sell 200 tickets they will bring in \$2000, which is \$400 over their goal.
- 47.** friend: 2 books; you: 6 books
- 48.** 6 in., 5 in.;  $P = 2l + 2w$ ,  
 $2(6) + 2(5) = 12 + 10 = 22$

**1.4 Mixed Review**

- 49.** 0.03    **50.** 0.035    **51.** 0.0525  
**52.**  $5\frac{1}{4}$  in.    **53.** 5 m    **54.** 23 ft  
**55.** 79    **56.**  $1\frac{1}{7}$     **57.** 60

**1.1–1.4 Mixed Review of Problem Solving**

- 1. a.** 7 in. by 7 in.  
**b.**  $2352 \text{ in.}^2$   
**c.** 70 in.    **d.**  $168 \text{ in.}^2$
- 2. a.**  $\frac{1}{3}h + 5$     **b.** 1 oz
- 3. a.**  $\frac{x}{20}$ ; if you divide the number of cars you have by 20 you will know how many shelves you need.  
**b.** 6 shelves
- 4. Sample answer:** A basketball player scores less than 15 points in a game. What is the most 3-point field goals the player could have scored? The solution  $x < 5$  means the player scored less than 5 3-point field goals.
- 5.** No; each quart costs \$2.50, so you will need \$5 for 2 quarts.
- 6. a.**  $9f + 4p + 4c$   
**b.** 174 calories  
**c.** About 713 calories; the teenager would need about 4.1 servings of cheese to get 45 grams of protein. So, 4.1 times 174 calories per serving is about 713 calories.

**Answers for 1.4** *continued*  
 For use with pages 24–27

7. 1352 in.<sup>3</sup>;

1	3	5	2
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



## Answers for 1.5

For use with pages 31–33

### 1.5 Skill Practice

- Sample answer:*  $d = rt$
- Sample answer:* Since you are filling a cubic container, you need to use the volume formula  $V = s^3$  where  $s$  is the length of an edge. Substituting 1.5 for  $s$  gives  $V = 1.5^3 = 3.375$  cubic feet. If the soil costs \$4 per cubic foot,  $3.375 \cdot 4 = \$13.50$  to fill the planter.
- You know how many collars you've made, how much you have spent to make them, and how much money you want to make. You need to find what to charge for each collar so you make \$90.
- 14 mi
- You know the temperature in Rome and the temperature in Dallas. You know the formula to convert Fahrenheit temperatures to Celsius temperatures. You need to find the higher temperature.
- The formula for perimeter is wrong;  $P = 2\ell + 2w$ ;  
 $P = 2(200) + 2(150) = 700$ ;  
 $\$10(700) = \$7000$ .
- The formula for perimeter should be used, not area;  $P = 2\ell + 2w$ ;  
 $P = 2(200) + 2(150) = 700$ ;  
 $\$10(700) = \$7000$ .
- $C = \frac{5}{9}(F - 32)$
- $P = I - E$       10.  $A = \frac{1}{2}bh$
- C                      12. D
- $\ell = \frac{P}{2} - w$ . *Sample answer:*  
Dividing the perimeter by 2 will give the sum of the length and the width. Subtracting the width will give the length.

### 1.5 Problem Solving

- \$126                      15. 110.25 in.<sup>2</sup>
- 18 wk                      17. 2 water bottles
- 10.35 oz
- a. 960 ft                      b. 480 ft
- a. 4 bags; \$110  
b. \$278.28  
c. 120; \$382.80;  
The perimeter of the park is  $150 + 200 + 250 = 600$  feet. A post is placed every 5 feet so divide 600 by 5, which is 120 posts. Multiply 120 by the cost per post,  
 $120 \cdot 3.19 = \$382.80$ .

## Answers for 1.5 *continued*

For use with pages 31–33

21. a.

<b>Room size (feet)</b>	1 by 1	2 by 2	3 by 3
<b>Remaining area (sq. ft)</b>	431	428	423

<b>Room size (feet)</b>	4 by 4	5 by 5
<b>Remaining area (sq. ft)</b>	416	407

b.  $1 \leq s \leq 5$ ; 5 ft

22. No. *Sample answer:* The width of the pen is 5 feet long. The farmer would need  $2(5) + 2(16) = 42$  feet of fencing.

23. a. 48 min; you: 3.2 mi,  
your friend: 8.8 mi

b. 3 min; you: 3 mi,  
your friend: 9 mi

### 1.5 Mixed Review

24.  $\frac{17}{20}$ ; 85%      25.  $1\frac{1}{4}$ ; 125%

26.  $\frac{49}{200}$ ; 24.5%      27.  $\frac{7}{1000}$ ; 0.7%

28.  $52 \text{ ft}^2$ ,  $24 \text{ ft}^3$       29.  $\frac{1}{3}v$

30.  $\frac{22}{h}$       31.  $2m + 7$

32.  $2(y + 3)$

## Answers for 1.6

For use with pages 38–40

### 1.6 Skill Practice

- input; output
- $a, b$ ; the value of  $b$  depends on  $a$ .
- domain: 0, 1, 2, and 3,  
range: 5, 7, 15, and 44
- domain: 3, 5, 7, and 8,  
range: 2, 3, 5, and 7
- domain: 6, 12, 21, and 42,  
range: 5, 7, 10, and 17
- function
- not a function
- function
- The pairing is a function. Each input is paired with only one output.
- The numbers listed are the domain, not the range. The range of the function is 6, 7, 8, and 9.

11. *Sample:*

Input	Output	Input	Output
0	5	0	5
1	6	1	6
2	7	2	7
3	9	3	7
4	10	4	9
5		5	10

12. B

13. A

14.

Input	12	15	22	30
Output	9	12	19	27

range: 9, 12, 19, and 27

15.

Input	4	5	7	8	12
Output	7.5	8.5	10.5	11.5	15.5

range: 7.5, 8.5, 10.5, 11.5, and 15.5

16.

Input	0	5	7	10
Output	4	19	25	34

range: 4, 19, 25, and 34

17.

Input	4	6	9	11
Output	5	6	7.5	8.5

range: 5, 6, 7.5, and 8.5

18.

Input	4	6	8	12
Output	3	$4\frac{1}{3}$	$5\frac{2}{3}$	$8\frac{1}{3}$

range: 3,  $4\frac{1}{3}$ ,  $5\frac{2}{3}$ , and  $8\frac{1}{3}$

19.

Input	0	2	4	6
Output	$\frac{1}{2}$	1	$1\frac{1}{2}$	2

range:  $\frac{1}{2}$ , 1,  $1\frac{1}{2}$ , and 2

20.  $y = x + 2.2$

21.  $y = x - 8$

**Answers for 1.6** *continued*  
For use with pages 38–40

22. *Sample answer:*

$t$	1	2	3	4
$v$	2	2	3	3

**1.6 Problem Solving**

23. **a.** the number of quarters left;  
the number of quarters used
- b.**  $y = 10 - x$ ; domain: 0, 1, 2, 3,  
4, 5, 6, 7, 8, 9, and 10
- c.** range: 0, 1, 2, 3, 4, 5, 6, 7, 8,  
9, and 10

<b>Input</b>	0	1	2	3	4
<b>Output</b>	10	9	8	7	6

<b>Input</b>	5	6	7	8	9	10
<b>Output</b>	5	4	3	2	1	0

24. **a.** amount of money you spend;  
the number of books you buy
- b.**  $y = $.75x$ ; domain: 0, 1, 2, 3,  
4, and 5
- c.**

<b>Input</b>	0	1	2	3	4	5
<b>Output</b>	0	0.75	1.5	2.25	3	3.75

range: 0, 0.75, 1.5, 2.25, 3,  
and 3.75

25.  $y = 100 + 20m$ ; independent  
variable:  $m$ , the number of  
months; dependent variable:  $y$ , the  
amount of money saved; domain:  
 $m > 0$ , range:  $y \geq 100$ ; \$340

26. *Sample answer:*  $W = 8h$ , where  $W$   
is wages and  $h$  is hours worked;  
the independent variable is  $h$ , the  
dependent variable is  $W$ .

27. **a.**

<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
A, B, C	D, E, F	G, H, I	J, K, L

<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
M, N, O	P, Q, R, S	T, U, V	W, X, Y, Z

No; because there is more than one  
output for each input.

**b.**

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>	<b>K</b>
2	2	2	3	3	3	4	4	4	5	5

<b>L</b>	<b>M</b>	<b>N</b>	<b>O</b>	<b>P</b>	<b>Q</b>	<b>R</b>	<b>S</b>	<b>T</b>	<b>U</b>	<b>V</b>
5	6	6	6	7	7	7	7	8	8	8

<b>W</b>	<b>X</b>	<b>Y</b>	<b>Z</b>
9	9	9	9

Yes; because there is only one  
output for each input.

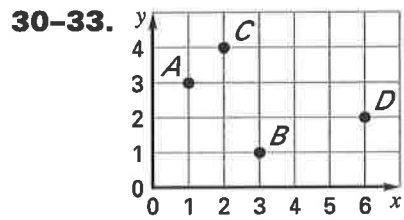
28. **a.**  $h = c + 8$       **b.** 38 mi/gal  
**c.** about \$634

**Answers for 1.6** *continued*  
For use with pages 39–40

29. a.  $c = 300s + 440(5 - s)$

b. 1850 cal

**1.6 Mixed Review**



34.  $13 - w = 5$

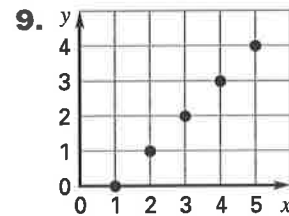
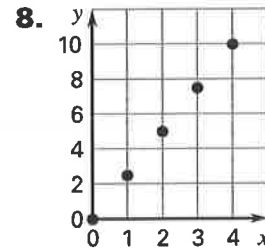
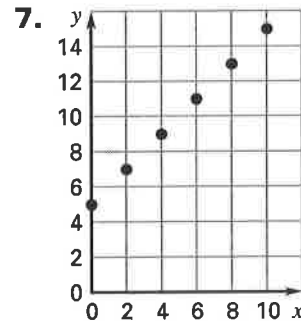
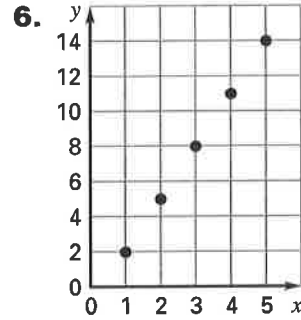
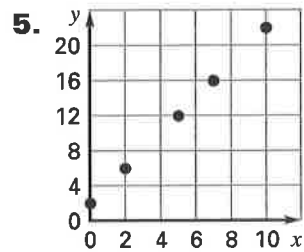
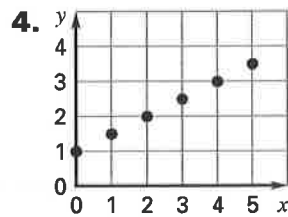
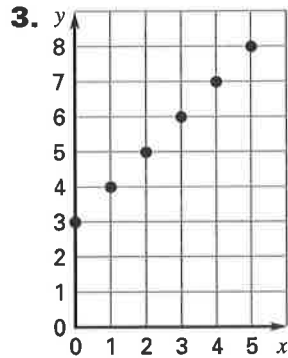
35.  $\frac{21}{d} \geq 7$       36. 12:30 P.M.

# Answers for 1.7

For use with pages 46–51

## 1.7 Skill Practice

1. domain; range
2. Find a relationship between the input values and the output values.



The domain and range are graphed backwards.

**Answers for 1.7** *continued*  
For use with pages 46–51

10.  $y = x$ ; domain: 0, 1, 2, 3, 4, 5, and 6, range: 0, 1, 2, 3, 4, 5, and 6

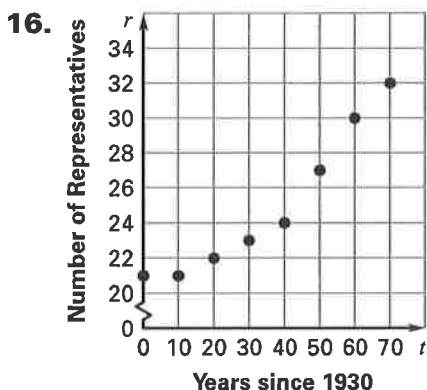
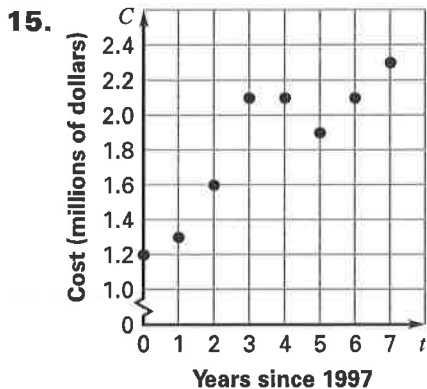
11.  $y = 2x - 2$ ; domain 1, 2, 3, and 4, range: 0, 2, 4, and 6

12.  $y = \frac{1}{2}x + 1$ ; domain 0, 1, 2, and 3, range:  $1, 1\frac{1}{2}, 2, 2\frac{1}{2}$

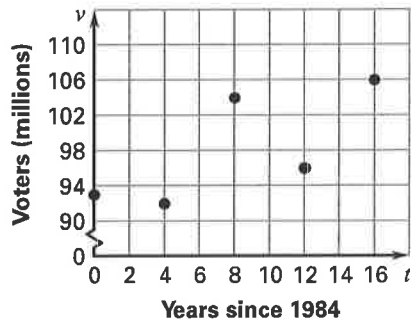
13. C

14. a.  $\frac{1}{2}x^2$                       b. 1.125

**1.7 Problem Solving**



17. 93, 92, 104, 96, 106;



18. Independent variable: the month, dependent variable: the hours of daylight; the number of daylight hours increases from January to May and then decreases through December.

19. a. increases

b. Yes; 27.5 grams is between the mass of an egg that is just under 38 millimeters long and an egg that is just over 38 millimeters long.

20. a. *Sample answer:* Count the number of blocks between the men's and women's times. Each block represents 10 minutes.

b. *Sample answer:* Between 1982 and 2002 the men's times are all within about 5 minutes of each other and the women's times are all within about 10 minutes of each other.

**Answers for 1.7** *continued*  
For use with pages 46–51

**1.7 Mixed Review**

21. >      22. <      23. <  
24. =      25. 8      26. 40  
27. 13      28. 64  
29.  $y = 10 - x$     30.  $y = \frac{1}{2}x + 5$

**1.5–1.7 Mixed Review  
of Problem Solving**

1. a. total cost = cost of cheese +  
(number of toppings)(cost of  
each topping)

b.

<b>Toppings</b>	0	1	2	3	4
<b>Cost (dollars)</b>	7	7.95	8.90	9.85	10.80

<b>Toppings</b>	5	6	7
<b>Cost (dollars)</b>	11.75	12.70	13.65

<b>Toppings</b>	8	9	10
<b>Cost (dollars)</b>	14.60	15.55	16.50

There is exactly one cost for each number of toppings, so the table represents a function. The domain is 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10. The range is 7, 7.95, 8.90, 9.85, 10.80, 11.75, 12.70, 13.65, 14.60, 15.55, and 16.50.

c. 8 toppings

2. a. profit = (number of cars) •  
(price per car) – cost of  
materials; \$525  
b. No; your materials cost is  
the same. Only the income  
doubled, not the profit.  
3. a.  $77 \text{ ft}^2$       b.  $823 \text{ ft}^2$   
c. 3 gal      d. \$74.85  
4.  $2^\circ\text{C}$ ;



5. No; it will take your family about  $4\frac{1}{2}$  hours to get to Jacksonville, so it will be after 5:30 P.M.



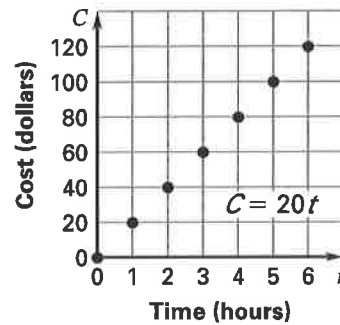
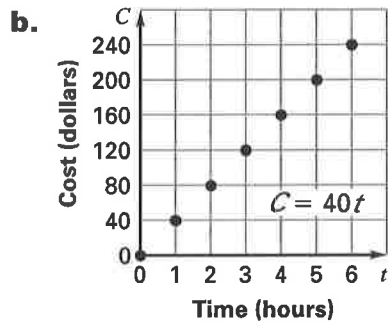
**Answers for 1.7** *continued*  
For use with pages 46–51

6. \$1272;

1	2	7	2
	0	0	0
	1	1	1
2		2	
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7		7
8	8	8	8
9	9	9	9

7. *Sample answer:* You are riding your bike to your friend's house 5 miles away. You need to be there in a half hour. What should your average speed be to get there in time?  $r = 10$ , you must ride your bike at 10 miles per hour to get to your friend's house in a half hour.

8. a.  $c = 40t$ ,  $c = 20t$



c.  $c = 60t$ ; this graph would begin higher on the y-axis and it would be steeper.