

## Chapter 2 *continued*

3.  $-8y = 40$                        $-8y = 40$   
 $-8(-5) \stackrel{?}{=} 40$                        $-8(5) \stackrel{?}{=} 40$   
 $40 = 40$  ✓                               $-40 \neq 40$   
 $-5$  is a solution.                       $5$  is not a solution.
4. Equation:  $x - 10 = 7$   
 Question: What number minus 10 equals 7?  
 Solution: 17  
 Check:  $17 - 10 = 7$  ✓
5. Equation:  $2 + n = -6$   
 Question: 2 plus what number equals  $-6$ ?  
 Solution:  $-8$   
 Check:  $2 + (-8) = -6$  ✓
6. Equation:  $3w = -15$   
 Question: 3 times what number equals  $-15$ ?  
 Solution:  $-5$   
 Check:  $3(-5) = -15$  ✓
7. Equation:  $4 = \frac{36}{s}$   
 Question: 4 equals 36 divided by what number?  
 Solution: 9  
 Check:  $4 = \frac{36}{9}$  ✓
8. Let  $x$  = the number of times people rode the go-carts.  
 Cost per ride  $\times$  Number of rides = Total income  
 $5x = 1000$   
 $5 \cdot 200 = 1000$   
 People rode the go-carts a total of 200 times.

### 2.4 Guided Practice (p. 87)

- A *solution* of an equation is a number that produces a true statement when it is substituted for the variable.
  - Sample answer:*  
 Equation:  $-4t = 28$   
 Question:  $-4$  times what number equals 28?
- |  |  |
|--|--|
| 3. $x + 10 = 15$<br>$5 + 10 \stackrel{?}{=} 15$<br>$15 = 15$ ✓<br>$5$ is a solution.   | 4. $3 - x = 2$<br>$3 - 5 \stackrel{?}{=} 2$<br>$-2 \neq 2$<br>$5$ is not a solution.               |
| 5. $-6x = 54$<br>$-6(5) \stackrel{?}{=} 54$<br>$-30 \neq 54$<br>$5$ is not a solution. | 6. $\frac{-40}{x} = -8$<br>$\frac{-40}{5} \stackrel{?}{=} -8$<br>$-8 = -8$ ✓<br>$5$ is a solution. |

7. (1) Let  $x$  = the number of quesadillas you need.  
 Number of wedges =  $4x$
- (2) 
$$\begin{array}{l} \text{Total} \\ \text{wedges} \end{array} = \begin{array}{l} \text{Number} \\ \text{of people} \end{array} \times \begin{array}{l} \text{Number of} \\ \text{wedges per} \\ \text{person} \end{array} = 12 \times 3 = 36$$
- You need 36 wedges.
- (3)  $4x = 36$   
 (4)  $4 \cdot 9 = 36$   
 So, 9 quesadillas are needed.

### 2.4 Practice and Problem Solving (pp. 87–89)

- |   |   |
|---|---|
| 8. $x - 8 = -4$   | 9. $26 + y = 43$  |
| 10. $\frac{p}{7} = 16$  | 11. $14m = 56$  |
| 12. $x + 9 = 12$<br>$-3 + 9 \stackrel{?}{=} 12$<br>$6 \neq 12$<br>$-3$ is not a solution. | 13. $21 - z = -4$<br>$21 - 25 \stackrel{?}{=} -4$<br>$-4 = -4$ ✓<br>$25$ is a solution.               |
| 14. $91 = 7c$<br>$91 \stackrel{?}{=} 7(13)$<br>$91 = 91$ ✓<br>$13$ is a solution.         | 15. $\frac{y}{4} = -8$<br>$\frac{32}{4} \stackrel{?}{=} -8$<br>$8 \neq -8$<br>$32$ is not a solution. |
| 16. C; Solution: 9  | 17. A; Solution: 4  |
| 18. D; Solution: $-9$   | 19. B; Solution: 36   |
20. Equation:  $x + 6 = 13$   
 Question: What number plus 6 equals 13?  
 Solution: 7  
 Check:  $7 + 6 = 13$  ✓
21. Equation:  $x - 8 = 20$   
 Question: What number minus 8 equals 20?  
 Solution: 28  
 Check:  $28 - 8 = 20$  ✓
22. Equation:  $0 = t + 79$   
 Question: 0 equals what number plus 79?  
 Solution:  $-79$   
 Check:  $0 = -79 + 79$  ✓
23. Equation:  $-4 + y = -9$   
 Question:  $-4$  plus what number equals  $-9$ ?  
 Solution:  $-5$   
 Check:  $-4 + (-5) = -9$  ✓
24. Equation:  $11 - p = 19$   
 Question: 11 minus what number equals 19?  
 Solution:  $-8$   
 Check:  $11 - (-8) = 19$  ✓

## Chapter 2 *continued*

- 25.** Equation:  $-2 = r - 7$   
 Question:  $-2$  equals what number minus 7?  
 Solution: 5  
 Check:  $-2 = 5 - 7$  ✓
- 26.** Equation:  $7x = 63$   
 Question: 7 times what number equals 63?  
 Solution: 9  
 Check:  $7(9) = 63$  ✓
- 27.** Equation:  $-10a = 130$   
 Question:  $-10$  times what number equals 130?  
 Solution:  $-13$   
 Check:  $-10(-13) = 130$  ✓
- 28.** Equation:  $-54 = -9g$   
 Question:  $-54$  equals  $-9$  times what number?  
 Solution: 6  
 Check:  $-54 = -9(6)$  ✓
- 29.** Equation:  $\frac{x}{5} = 6$   
 Question: What number divided by 5 equals 6?  
 Solution: 30  
 Check:  $\frac{30}{5} = 6$  ✓
- 30.** Equation:  $\frac{48}{u} = -3$   
 Question: 48 divided by what number equals  $-3$ ?  
 Solution:  $-16$   
 Check:  $\frac{48}{-16} = -3$  ✓
- 31.** Equation:  $1 = \frac{n}{231}$   
 Question: 1 equals what number divided by 231?  
 Solution: 231  
 Check:  $1 = \frac{231}{231}$  ✓
- 32.**  $d = rt$   
 $400 = 50t$   
 $400 = 50 \cdot 8$   
 It takes a dragonfly about 8 seconds to travel 400 feet.
- 33.** Let  $x$  = the sales in 2000.  
 Sales in 2000  $\frac{\text{Decline in sales}}{2001}$  = Sales in 2001  
 $x - 6 = 128$   
 $134 - 6 = 128$   
 About 134 million personal computers were sold in 2000.

- 34.** Let  $x$  = the total weight of the trail mix.

$$\text{Weight per portion} = \frac{\text{Total weight}}{\text{Number of portions}}$$

$$3 = \frac{x}{8}$$

$$3 = \frac{24}{8}$$

The total weight of the trail mix was 24 ounces.

- 35. a.**  $P = x + 9 + 8 + 5 + 9 = 35$   
 $x + 31 = 35$
- b.**  $4 + 31 = 35$   
 $x = 4$  cm
- 36. a. Sample answer:** To find the Kelvin temperature, add 273 to the temperature in degrees Celsius.
- b.**  $K = C + 273$   
 $0 = C + 273$   
 $0 = -273 + 273$   
 Absolute zero is  $-273^\circ\text{C}$ .

**c.**

Element	Nitrogen	Chlorine	Gallium	Radium
<b>Melting point (K)</b>	63	172	303	973
<b>Melting point (<math>^\circ\text{C}</math>)</b>	$-210$	$-101$	30	700

- d. Sample answer:** Ask the question: What number minus 273 equals  $C$ ?  
 $C = K - 273$
- 37. Sample answer:** An expression consists of numbers, operations, and sometimes variables but no equal sign or inequality signs. An example is  $24x - 7$ . An equation uses an equal sign to show that an expression is equal to a number or another expression between them. An example is  $24x - 7 = 17$ .
- 38. a.** Let  $n$  = the number of strips.  
 Width of each strip =  $\frac{\text{Width of paper}}{\text{Number of strips}} = \frac{9}{n}$
- b.** Let  $n$  = the number of links.  
 $0.75 = \frac{9}{n}$   
 (1) Read and Understand  
 (2) Make a Plan: Guess, Check, and Revise

—CONTINUED—

## Chapter 2 continued

### 38. —CONTINUED—

- (3) Solve the Problem: Guess the number of links the chain will have. Try  $n = 10$ .

$$\frac{9}{n} = \frac{9}{10} = 0.9$$

Because the width of each link is too long, 10 is too low.

Continue until you arrive at 12.

$$\frac{9}{12} = 0.75$$

So, your paper chain will have 12 links.

- (4) Look Back

39. a. Let  $x =$  the time in seconds.

$$\begin{array}{r} \text{Beginning} \\ \text{altitude} \end{array} + \begin{array}{r} \text{Rate of} \\ \text{climb} \end{array} \cdot \begin{array}{r} \text{Climbing} \\ \text{time} \end{array} = \begin{array}{r} \text{Final} \\ \text{altitude} \end{array}$$

$$200 + 800x = 13,000$$

b.

X	Y1
12	9800
13	10600
14	11400
15	12200
16	13000
17	13800

X=16

$x = 16$ ; it takes the Thunderbirds 16 seconds to complete the climb.

40. 4; *Sample answer:* First, I thought of  $2x$  as an unknown number and asked myself, “3 more than what number is 11?” Because this number is 8, I knew that  $2x$  must be equal to 8. Then I asked myself, “Twice what number is 8?” This number is 4, the solution of the original equation.

### 2.4 Mixed Review (p. 89)

41. When  $x = -5$  and  $y = -3$ ;  $x + y = -5 + (-3) = -8$
42. When  $x = -5$  and  $y = -3$ ;  $x - y + 6 = -5 - (-3) + 6$   
 $= -5 + 3 + 6$   
 $= -2 + 6$   
 $= 4$
43. When  $x = -5$  and  $y = -3$ ;  
 $-x + 2 + 3y = -(-5) + 2 + 3(-3)$   
 $= 5 + 2 + (-9)$   
 $= 7 + (-9)$   
 $= -2$
44.  $8(104) = 8(100 + 4) = 8(100) + 8(4) = 800 + 32 = 832$
45.  $5(197) = 5(200 - 3) = 5(200) - 5(3) = 1000 - 15 = 985$
46.  $4(2.8) = 4(3 - 0.2) = 4(3) - 4(0.2) = 12 - 0.8 = 11.2$
47.  $5c + 2 + 7c = 5c + 7c + 2 = 12c + 2$
48.  $13k - 8k - k = 4k$
49.  $6x - 3 + 4x + 1 = 6x + 4x - 3 + 1 = 10x - 2$
50.  $3(y + 7) + 11y = 3y + 21 + 11y$   
 $= 3y + 11y + 21$   
 $= 14y + 21$

51.  $p - 6 - (4 + p) = p - 6 - 4 - p$   
 $= p - p - 6 - 4$   
 $= 0 - 10$   
 $= -10$

52.  $2n - 7(n - 8) = 2n - 7n + 56 = -5n + 56$

### 2.4 Standardized Test Practice (p. 89)

53. B
54. H;  $12p = 60$   
 $12(5) = 60$

### Lesson 2.5

#### 2.5 Concept Activity (p. 90)

1. A
2.  $x + 1 = 4$

The solution is 3.

3.  $x + 2 = 6$

The solution is 4.

4.  $x + 5 = 7$

The solution is 2.

5.  $x + 4 = 10$

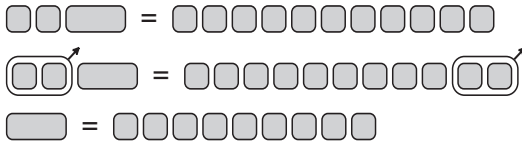
The solution is 6.

6.  $3 + x = 8$

The solution is 5.

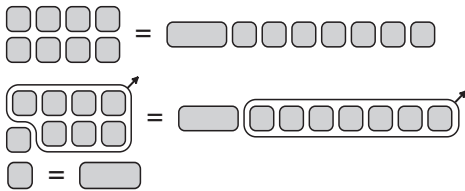
## Chapter 2 *continued*

7.  $2 + x = 11$



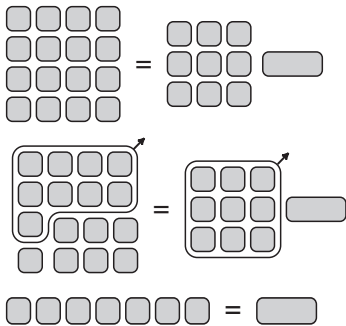
The solution is 9.

8.  $8 = x + 7$



The solution is 1.

9.  $16 = 9 + x$



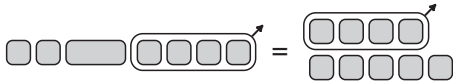
The solution is 7.

10. Three 1-tiles must be taken from each side in order to keep both sides of the equation equal.

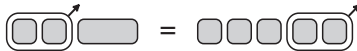
11.  $2 + x + 4 = 9$



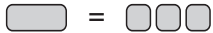
Take away 4 1-tiles from each side.



Take away 2 1-tiles from each side.



The remaining tiles show that  $x = 3$ .



### 2.5 Checkpoint (p. 92)

1.  $x + 8 = 19$

$$x + 8 - 8 = 19 - 8$$

$$x = 11$$

Check:  $x + 8 = 19$

$$11 + 8 \stackrel{?}{=} 19$$

$$19 = 19 \checkmark$$

2.  $-7 = y + 13$

$$-7 - 13 = y + 13 - 13$$

$$-20 = y$$

Check:  $-7 = y + 13$

$$-7 \stackrel{?}{=} -20 + 13$$

$$-7 = -7 \checkmark$$

3.  $n - 4 = -11$

$$n - 4 + 4 = -11 + 4$$

$$n = -7$$

Check:  $n - 4 = -11$

$$-7 - 4 \stackrel{?}{=} -11$$

$$-11 = -11 \checkmark$$

4.  $26 = p - 61$

$$26 + 61 = p - 61 + 61$$

$$87 = p$$

Check:  $26 = p - 61$

$$26 \stackrel{?}{=} 87 - 61$$

$$26 = 26 \checkmark$$

5. Let  $w$  = the weight of the cat.

Weight of cat	+	Weight of Ben	=	Combined weight
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$$w + 148 = 161$$

$$w + 148 - 148 = 161 - 148$$

$$w = 13$$

The cat weighs 13 pounds.

### 2.5 Guided Practice (p. 93)

1. Addition and subtraction are *inverse* operations.

2. *Sample answer:* Because the number 12 is the solution of both equations.

3.  $x + 4 = 10$

$$x + 4 - 4 = 10 - 4$$

$$x = 6$$

Check:  $x + 4 = 10$

$$6 + 4 \stackrel{?}{=} 10$$

$$10 = 10 \checkmark$$

4.  $t + 9 = -5$

$$t + 9 - 9 = -5 - 9$$

$$t = -14$$

Check:  $t + 9 = -5$

$$-14 + 9 \stackrel{?}{=} -5$$

$$-5 = -5 \checkmark$$

5.  $u - 3 = 6$

$$u - 3 + 3 = 6 + 3$$

$$u = 9$$

Check:  $u - 3 = 6$

$$9 - 3 \stackrel{?}{=} 6$$

$$6 = 6 \checkmark$$

## Chapter 2 *continued*

$$\begin{aligned} 6. \quad y - 7 &= -2 \\ y - 7 + 7 &= -2 + 7 \\ y &= 5 \end{aligned}$$

$$\begin{aligned} \text{Check: } y - 7 &= -2 \\ 5 - 7 &\stackrel{?}{=} -2 \\ -2 &= -2 \quad \checkmark \end{aligned}$$

$$\begin{aligned} 7. \quad 16 &= a + 25 \\ 16 - 25 &= a + 25 - 25 \\ -9 &= a \end{aligned}$$

$$\begin{aligned} \text{Check: } 16 &= a + 25 \\ 16 &\stackrel{?}{=} -9 + 25 \\ 16 &= 16 \quad \checkmark \end{aligned}$$

$$\begin{aligned} 8. \quad -70 &= b - 30 \\ -70 + 30 &= b - 30 + 30 \\ -40 &= b \end{aligned}$$

$$\begin{aligned} \text{Check: } -70 &= b - 30 \\ -70 &\stackrel{?}{=} -40 - 30 \\ -70 &= -70 \quad \checkmark \end{aligned}$$

9. The number 8 was subtracted from the left side of the equation, but added to the right side. It should have been subtracted from each side.

$$\begin{aligned} x + 8 &= 10 \\ x + 8 - 8 &= 10 - 8 \\ x &= 2 \end{aligned}$$

10. Let  $x$  = the population in 1990.

$$\begin{array}{r} \text{Population} + \text{Increase in} = \text{Population} \\ \text{in 1990} \quad \text{population} \quad \text{in 2000} \\ x + 236 = 3905 \\ x + 236 - 236 = 3905 - 236 \\ x = 3669 \end{array}$$

The population in 1990 was 3669 people.

### 2.5 Practice and Problem Solving (pp. 93–95)

$$\begin{aligned} 11. \quad x + 7 &= 12 \\ x + 7 - 7 &= 12 - 7 \\ x &= 5 \\ \text{Check: } x + 7 &= 12 \\ 5 + 7 &\stackrel{?}{=} 12 \\ 12 &= 12 \quad \checkmark \end{aligned}$$

$$\begin{aligned} 12. \quad y + 9 &= 0 \\ y + 9 - 9 &= 0 - 9 \\ y &= -9 \\ \text{Check: } y + 9 &= 0 \\ -9 + 9 &\stackrel{?}{=} 0 \\ 0 &= 0 \quad \checkmark \end{aligned}$$

$$\begin{aligned} 13. \quad -2 &= z + 6 \\ -2 - 6 &= z + 6 - 6 \\ -8 &= z \\ \text{Check: } -2 &= z + 6 \\ -2 &\stackrel{?}{=} -8 + 6 \\ -2 &= -2 \quad \checkmark \end{aligned}$$

$$\begin{aligned} 14. \quad a - 5 &= 8 \\ a - 5 + 5 &= 8 + 5 \\ a &= 13 \\ \text{Check: } a - 5 &= 8 \\ 13 - 5 &\stackrel{?}{=} 8 \\ 8 &= 8 \quad \checkmark \end{aligned}$$

$$\begin{aligned} 15. \quad b - 14 &= -3 \\ b - 14 + 14 &= -3 + 14 \\ b &= 11 \\ \text{Check: } b - 14 &= -3 \\ 11 - 14 &\stackrel{?}{=} -3 \\ -3 &= -3 \quad \checkmark \end{aligned}$$

$$\begin{aligned} 16. \quad 37 &= c - 29 \\ 37 + 29 &= c - 29 + 29 \\ 66 &= c \\ \text{Check: } 37 &= c - 29 \\ 37 &\stackrel{?}{=} 66 - 29 \\ 37 &= 37 \quad \checkmark \end{aligned}$$

$$\begin{aligned} 17. \quad 21 + m &= 4 \\ 21 - 21 + m &= 4 - 21 \\ m &= -17 \\ \text{Check: } 21 + m &= 4 \\ 21 + (-17) &\stackrel{?}{=} 4 \\ 4 &= 4 \quad \checkmark \end{aligned}$$

$$\begin{aligned} 18. \quad n - 72 &= 72 \\ n - 72 + 72 &= 72 + 72 \\ n &= 144 \\ \text{Check: } n - 72 &= 72 \\ 144 - 72 &\stackrel{?}{=} 72 \\ 72 &= 72 \quad \checkmark \end{aligned}$$

$$\begin{aligned} 19. \quad p - 24 &= -53 \\ p - 24 + 24 &= -53 + 24 \\ p &= -29 \\ \text{Check: } p - 24 &= -53 \\ -29 - 24 &\stackrel{?}{=} -53 \\ -53 &= -53 \quad \checkmark \end{aligned}$$

## Chapter 2 *continued*

20.  $q + 8 = 57$

$$q + 8 - 8 = 57 - 8$$

$$q = 49$$

Check:  $q + 8 = 57$

$$49 + 8 \stackrel{?}{=} 57$$

$$57 = 57 \checkmark$$

21.  $r - 23 = -6$

$$r - 23 + 23 = -6 + 23$$

$$r = 17$$

Check:  $r - 23 = -6$

$$17 - 23 \stackrel{?}{=} -6$$

$$-6 = -6 \checkmark$$

22.  $28 = g + 28$

$$28 - 28 = g + 28 - 28$$

$$0 = g$$

Check:  $28 = g + 28$

$$28 \stackrel{?}{=} 0 + 28$$

$$28 = 28 \checkmark$$

23.  $-13 + t = 10$

$$-13 + 13 + t = 10 + 13$$

$$t = 23$$

Check:  $-13 + t = 10$

$$-13 + 23 \stackrel{?}{=} 10$$

$$10 = 10 \checkmark$$

24.  $216 = u - 129$

$$216 + 129 = u - 129 + 129$$

$$345 = u$$

Check:  $216 = u - 129$

$$216 \stackrel{?}{=} 345 - 129$$

$$216 = 216 \checkmark$$

25.  $177 = 403 + w$

$$177 - 403 = 403 - 403 + w$$

$$-226 = w$$

Check:  $177 = 403 + w$

$$177 \stackrel{?}{=} 403 + (-226)$$

$$177 = 177 \checkmark$$

26. Let  $x$  = the price before the rebate.

Price before rebate	-	Rebate amount	=	Price after rebate
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$$x - 30 = 185$$

$$x - 30 + 30 = 185 + 30$$

$$x = 215$$

The price of the DVD player before the rebate is applied is \$215.

27. Let  $x$  = the maximum temperature tolerated by a Japanese giant hornet.

Maximum temperature of hornet	+	Difference in temperature	=	Maximum temperature of honeybees
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$$x + 3 = 48$$

$$x + 3 - 3 = 48 - 3$$

$$x = 45$$

The maximum temperature tolerated by a Japanese giant hornet is 45°C.

28. Let  $x$  = the original height of the Great Pyramid.

Original height	-	Feet lost	=	Current height
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$$x - 30 = 451$$

$$x - 30 + 30 = 451 + 30$$

$$x = 481$$

The original height of the Great Pyramid was 481 feet.

29. Let  $x$  = the distance from the summit.

Height climbed	+	Distance from the summit	=	Height of summit
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$$26,000 + x = 29,035$$

$$26,000 - 26,000 + x = 29,035 - 26,000$$

$$x = 3035$$

Stacy Allison got 3035 feet from the summit.

30. Let  $x$  = the distance in the expanded phase.

Distance in expanded phase	-	Difference in phases	=	Distance in contracted phase
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$$x - 5 = 51$$

$$x - 5 + 5 = 51 + 5$$

$$x = 56$$

Zeta Geminorum is 56 million miles across in its expanded phase.

31. Instead of subtracting 9 from both sides, you could add -9 to both sides.

$$x + 9 = -3$$

$$x + 9 + (-9) = -3 + (-9)$$

$$x = -12$$

32.  $a + 5 + 8 = 20$

$$a + 13 = 20$$

$$a + 13 - 13 = 20 - 13$$

$$a = 7$$

Check:  $a + 5 + 8 = 20$

$$7 + 5 + 8 \stackrel{?}{=} 20$$

$$20 = 20 \checkmark$$

## Chapter 2 *continued*

$$\begin{aligned}
 33. \quad & 3 + c + 6 = -9 \\
 & c + 3 + 6 = -9 \\
 & c + 9 = -9 \\
 & c + 9 - 9 = -9 - 9 \\
 & c = -18 \\
 \text{Check:} \quad & 3 + c + 6 = -9 \\
 & 3 + (-18) + 6 \stackrel{?}{=} -9 \\
 & -9 = -9 \quad \checkmark
 \end{aligned}$$

$$\begin{aligned}
 34. \quad & 9 + x - 4 = 2 \\
 & x + 9 - 4 = 2 \\
 & x + 5 = 2 \\
 & x + 5 - 5 = 2 - 5 \\
 & x = -3
 \end{aligned}$$

$$\begin{aligned}
 \text{Check:} \quad & 9 + x - 4 = 2 \\
 & 9 + (-3) - 4 \stackrel{?}{=} 2 \\
 & 2 = 2 \quad \checkmark
 \end{aligned}$$

$$\begin{aligned}
 35. \quad & n - 6 - 1 = 5 \\
 & n - 7 = 5 \\
 & n - 7 + 7 = 5 + 7 \\
 & n = 12
 \end{aligned}$$

$$\begin{aligned}
 \text{Check:} \quad & n - 6 - 1 = 5 \\
 & 12 - 6 - 1 \stackrel{?}{=} 5 \\
 & 5 = 5 \quad \checkmark
 \end{aligned}$$

$$\begin{aligned}
 36. \quad & 0 = r + 7 - 32 \\
 & 0 = r - 25 \\
 & 0 + 25 = r - 25 + 25 \\
 & 25 = r
 \end{aligned}$$

$$\begin{aligned}
 \text{Check:} \quad & 0 = r + 7 - 32 \\
 & 0 \stackrel{?}{=} 25 + 7 - 32 \\
 & 0 = 0 \quad \checkmark
 \end{aligned}$$

$$\begin{aligned}
 37. \quad & -5 = -17 + y + 8 \\
 & -5 = y - 17 + 8 \\
 & -5 = y - 9 \\
 & -5 + 9 = y - 9 + 9 \\
 & 4 = y
 \end{aligned}$$

$$\begin{aligned}
 \text{Check:} \quad & -5 = -17 + y + 8 \\
 & -5 \stackrel{?}{=} -17 + 4 + 8 \\
 & -5 = -5 \quad \checkmark
 \end{aligned}$$

$$\begin{aligned}
 38. \quad & P = a + b + c \\
 & 34 = x + 11 + 14 \\
 & 34 = x + 25 \\
 & 34 - 25 = x + 25 - 25 \\
 & 9 = x \\
 \text{So, } & x = 9 \text{ inches.}
 \end{aligned}$$

$$\begin{aligned}
 39. \quad & P = a + b + c \\
 & 59 = 22 + 13 + x \\
 & 59 = 35 + x \\
 & 59 - 35 = 35 - 35 + x \\
 & 24 = x
 \end{aligned}$$

So,  $x = 24$  centimeters.

$$\begin{aligned}
 40. \quad & P = 2\ell + 2w \\
 & 352 = 2(110) + 2(x) \\
 & 352 = 220 + 2x \\
 & 352 - 220 = 220 - 220 + 2x \\
 & 132 = 2x
 \end{aligned}$$

Because  $2x = 132$ ,  $x = 66$ .

So,  $x = 66$  feet.

41. a. Let  $x$  = the LDL level.

$$\text{Total cholesterol} = \text{LDL} + \text{HDL} + \frac{\text{Triglycerides}}{5}$$

$$190 = x + 45 + \frac{125}{5}$$

$$\text{b.} \quad 190 = x + 45 + \frac{125}{5}$$

$$190 = x + 45 + 25$$

$$190 = x + 70$$

$$190 - 70 = x + 70 - 70$$

$$120 = x$$

The LDL level is 120 mg/dL.

c. The LDL level of the given patient is borderline.

42. a. Let  $x$  = the change in the Vasa's position.

$$\begin{array}{r}
 \text{Original} \\
 \text{depth}
 \end{array}
 +
 \begin{array}{r}
 \text{Change in} \\
 \text{Vasa's position}
 \end{array}
 =
 \begin{array}{r}
 \text{Shallower} \\
 \text{depth}
 \end{array}$$

$$-105 + x = -50$$

$$-105 + 105 + x = -50 + 105$$

$$x = 55$$

The change in Vasa's position was an increase of 55 feet due to the salvage work in 1959.

b. Let  $x$  = the number of years underwater.

$$\begin{array}{r}
 \text{Year} \\
 \text{ship sank}
 \end{array}
 +
 \begin{array}{r}
 \text{Number} \\
 \text{of years} \\
 \text{underwater}
 \end{array}
 =
 \begin{array}{r}
 \text{Year ship} \\
 \text{was lifted} \\
 \text{the surface}
 \end{array}$$

$$1628 + x = 1961$$

$$1628 - 1628 + x = 1961 - 1628$$

$$x = 333$$

The Vasa remained underwater for 333 years.

43. Because  $34 = y$ ,  $y + 5 = 34 + 5 = 39$ .

So,  $39 = y + 5$ .

## Chapter 2 *continued*

44. Let  $x$  = the amount spent on fabric for a decorative border.

Yards of solid- color	×	Solid- color per yard	+	Yards of printed	×	Printed cost per yard	=	Total cost
+ Yards of batting	×	Batting cost per yard	+	Decorative border				
		$5 \times 4 + 12 \times 8 + 2 \times 11 + x = 150$						
		$20 + 96 + 22 + x = 150$						
		$116 + 22 + x = 150$						
		$138 + x = 150$						
		$138 - 138 + x = 150 - 138$						
		$x = 12$						

You can spend \$12 on fabric for a decorative border.

45. Let  $x$  = the sales of tennis shoes in 1996.

Cost in 1996	+ Change from 1996–1997	+ Change from 1997–1998		
	+ Change from 1998–1999	+ Change from 1999–2000	=	Cost in 2000
		$x + 4 + (-30) + (-10) + 15 = 520$		
		$x + (-21) = 520$		
		$x - 21 = 520$		
		$x - 21 + 21 = 520 + 21$		
		$x = 541$		

In 1996, the sales of tennis shoes were \$541 million.

### 2.5 Mixed Review (p. 95)

46.  $6 \cdot 6 \cdot 6 \cdot 6 = 6^4$       47.  $(0.3)(0.3) = (0.3)^2$   
 48.  $x \cdot x \cdot x = x^3$       49.  $t \cdot t \cdot t \cdot t \cdot t \cdot t = t^6$   
 50.  $2^6 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 64$   
 51.  $7^4 = 7 \cdot 7 \cdot 7 \cdot 7 = 2401$   
 52.  $(0.8)^2 = (0.8)(0.8) = 0.64$   
 53.  $(2.5)^3 = (2.5)(2.5)(2.5) = 15.625$   
 54. The opposite of 8 is  $-8$ .  
 55. The opposite of  $-27$  is 27.  
 56. The opposite of 0 is 0.  
 57. The opposite of 144 is  $-144$ .  
 58. When  $x = 4$ ;  $|x| = |4| = 4$   
 59. When  $y = -7$ ;  $|y| = |-7| = 7$   
 60. When  $y = -7$ ;  $|y| + |-y| = |-7| + |-(-7)|$   
 $= |-7| + |7|$   
 $= 7 + 7$   
 $= 14$   
 61. When  $x = 4$  and  $y = -7$ ;  
 $|y| - |-x| = |-7| - |-4| = 7 - 4 = 3$   
 62.  $d = rt$   
 $60 = 20t$   
 $60 = 20 \cdot 3$   
 So, it takes a dolphin 3 hours to swim 60 miles.

### 2.5 Standardized Test Practice (p. 95)

63. A;  $x + 18 = -13$   
 $x + 18 - 18 = -13 - 18$   
 $x = -31$
64. H;  $-21 = a - 47$   
 $-21 + 47 = a - 47 + 47$   
 $26 = a$
65. Let  $x$  = the number of employees at the beginning of the year.  
 Write a verbal model.
- |  |                         |                             |   |  |
|--|-------------------------|-----------------------------|---|--|
| Employees at<br>the beginning<br>of the year | +<br>Employees<br>hired | –<br>Employees<br>that left | = | Employees<br>at the end<br>of the year |
|  |                         |                             |   | $x + 140 - 93 = 816$                   |
- Combine like terms.  
 $x + 47 = 816$
- Subtract 47 from each side.  
 $x + 47 - 47 = 816 - 47$   
 $x = 769$
- There were 769 employees at the beginning of the year.

### Lesson 2.6

#### 2.6 Concept Activity (p. 96)

1.  $2x = 4$

$$\boxed{\phantom{00}} \boxed{\phantom{00}} = \boxed{\phantom{00}} \boxed{\phantom{00}} \boxed{\phantom{00}} \boxed{\phantom{00}}$$

$$\frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} = \frac{\boxed{\phantom{00}} \boxed{\phantom{00}}}{\boxed{\phantom{00}} \boxed{\phantom{00}}}$$

$$\boxed{\phantom{00}} = \boxed{\phantom{00}} \boxed{\phantom{00}}$$

The solution is 2.

2.  $2x = 10$

$$\boxed{\phantom{00}} = \boxed{\phantom{00}} \boxed{\phantom{00}} \boxed{\phantom{00}} \boxed{\phantom{00}} \boxed{\phantom{00}} \boxed{\phantom{00}}$$

$$\frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} = \frac{\boxed{\phantom{00}} \boxed{\phantom{00}} \boxed{\phantom{00}} \boxed{\phantom{00}}}{\boxed{\phantom{00}} \boxed{\phantom{00}} \boxed{\phantom{00}} \boxed{\phantom{00}}}$$

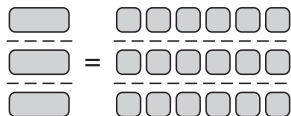
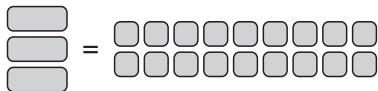
$$\boxed{\phantom{00}} = \boxed{\phantom{00}} \boxed{\phantom{00}} \boxed{\phantom{00}} \boxed{\phantom{00}}$$

The solution is 5.



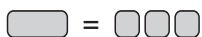
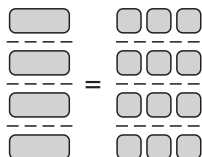
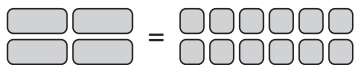
## Chapter 2 *continued*

3.  $3x = 18$



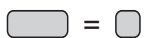
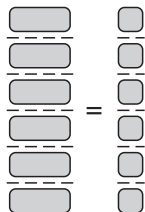
The solution is 6.

4.  $4x = 12$



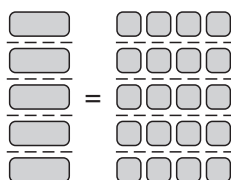
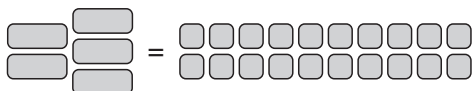
The solution is 3.

5.  $6x = 6$



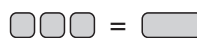
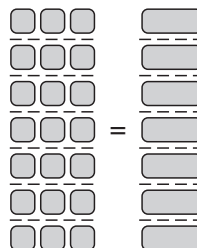
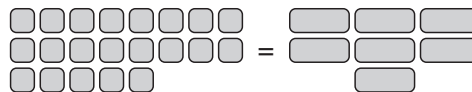
The solution is 1.

6.  $5x = 20$



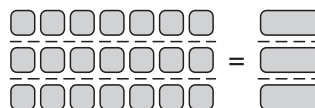
The solution is 4.

7.  $21 = 7x$



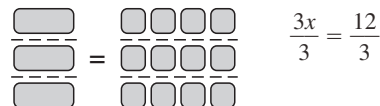
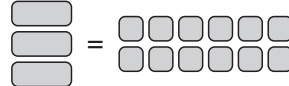
The solution is 3.

8.  $21 = 3x$



The solution is 7.

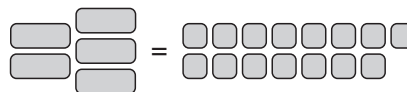
9.  $3x = 12$



*Sample answer:* Model  $8x = 56$  with algebra tiles. There are eight  $x$ -tiles, so divide the  $x$ -tiles and 1-tiles into eight equal groups. One  $x$ -tile is equal to seven 1-tiles. The solution is 7.

10.  $2x + 3x = 15$

Model the equation with algebra tiles. Group like terms.

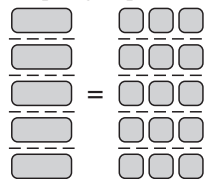


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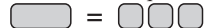
## Chapter 2 *continued*

### 10. —CONTINUED—

There are 5  $x$ -tiles, so divide the  $x$ -tiles and 1-tiles into 5 equal groups.



One  $x$ -tile is equal to three 1-tiles.



So, the solution is 3.

### 2.6 Checkpoint (p. 98)

1.  $2x = 18$

$$\frac{2x}{2} = \frac{18}{2}$$

$$x = 9$$

Check:  $2x = 18$

$$2(9) \stackrel{?}{=} 18$$

$$18 = 18 \checkmark$$

3.  $\frac{y}{2} = 13$

$$2 \cdot \frac{y}{2} = 2 \cdot 13$$

$$y = 26$$

Check:  $\frac{y}{2} = 13$

$$\frac{26}{2} \stackrel{?}{=} 13$$

$$13 = 13 \checkmark$$

2.  $-60 = -5a$

$$\frac{-60}{-5} = \frac{-5a}{-5}$$

$$12 = a$$

Check:  $-60 = -5a$

$$-60 \stackrel{?}{=} -5(12)$$

$$-60 = -60 \checkmark$$

4.  $-8 = \frac{b}{8}$

$$8 \cdot (-8) = 8 \cdot \frac{b}{8}$$

$$-64 = b$$

Check:  $-8 = \frac{b}{8}$

$$-8 \stackrel{?}{=} \frac{-64}{8}$$

$$-8 = -8 \checkmark$$

### 2.6 Guided Practice (p. 99)

1. Multiplication and *division* are inverse operations.

2. You would use the multiplication property of equality.

*Sample answer:*  $x$  is divided by 5, so I need to perform the inverse operation of division, which is multiplication, to get  $x$  alone on one side of the equation. I must multiply each side by 5.

3.  $5c = -15$

$$\frac{5c}{5} = \frac{-15}{5}$$

$$c = -3$$

Check:  $5c = -15$

$$5(-3) \stackrel{?}{=} -15$$

$$-15 = -15 \checkmark$$

4.  $54 = 9x$

$$\frac{54}{9} = \frac{9x}{9}$$

$$6 = x$$

Check:  $54 = 9x$

$$54 \stackrel{?}{=} 9(6)$$

$$54 = 54 \checkmark$$

5.  $6 = \frac{u}{4}$

$$4 \cdot 6 = 4 \cdot \frac{u}{4}$$

$$24 = u$$

Check:  $6 = \frac{u}{4}$

$$6 \stackrel{?}{=} \frac{24}{4}$$

$$6 = 6 \checkmark$$

6.  $\frac{y}{-10} = 7$

$$(-10) \left( \frac{y}{-10} \right) = (-10)7$$

$$y = -70$$

Check:  $\frac{y}{-10} = 7$

$$\frac{-70}{-10} \stackrel{?}{=} 7$$

$$7 = 7 \checkmark$$

7. (1) Let  $b$  = the time in minutes.

$$\begin{array}{r} \text{Pages per} \\ \text{minute} \end{array} \times \begin{array}{r} \text{Number of} \\ \text{minutes} \end{array} = \begin{array}{r} \text{Number} \\ \text{of pages} \end{array}$$

$$8b = 40$$

$$\frac{8b}{8} = \frac{40}{8}$$

$$b = 5$$

It takes 5 minutes to print the black and white document.

(2) Let  $c$  = the time in minutes.

$$\begin{array}{r} \text{Pages per} \\ \text{minute} \end{array} \times \begin{array}{r} \text{Number of} \\ \text{minutes} \end{array} = \begin{array}{r} \text{Number} \\ \text{of pages} \end{array}$$

$$5c = 20$$

$$\frac{5c}{5} = \frac{20}{5}$$

$$c = 4$$

It takes 4 minutes to print the color document.

(3) It takes  $5 + 4 = 9$  minutes to print both documents.

### 2.6 Practice and Problem Solving (pp. 99–101)

8.  $3x = 27$

$$\frac{3x}{3} = \frac{27}{3}$$

$$x = 9$$

Check:  $3x = 27$

$$3(9) \stackrel{?}{=} 27$$

$$27 = 27 \checkmark$$

9.  $4y = 52$

$$\frac{4y}{4} = \frac{52}{4}$$

$$y = 13$$

Check:  $4y = 52$

$$4(13) \stackrel{?}{=} 52$$

$$52 = 52 \checkmark$$

10.  $-65 = 13u$

$$\frac{-65}{13} = \frac{13u}{13}$$

$$-5 = u$$

Check:  $-65 = 13u$

$$-65 \stackrel{?}{=} 13(-5)$$

$$-65 = -65 \checkmark$$

11.  $84 = -21v$

$$\frac{84}{-21} = \frac{-21v}{-21}$$

$$-4 = v$$

Check:  $84 = -21v$

$$-84 \stackrel{?}{=} -21(-4)$$

$$84 = 84 \checkmark$$

## Chapter 2 continued

12.  $\frac{x}{7} = 5$

$$7 \cdot \frac{x}{7} = 7 \cdot 5$$

$$x = 35$$

Check:  $\frac{x}{7} = 5$

$$\frac{35}{7} \stackrel{?}{=} 5$$

$$5 = 5 \checkmark$$

14.  $16 = \frac{p}{6}$

$$6 \cdot 16 = 6 \cdot \frac{p}{6}$$

$$96 = p$$

Check:  $16 = \frac{p}{6}$

$$16 \stackrel{?}{=} \frac{96}{6}$$

$$16 = 16 \checkmark$$

16.  $-23a = 0$

$$\frac{-23a}{-23} = \frac{0}{-23}$$

$$a = 0$$

Check:  $-23a = 0$

$$-23(0) \stackrel{?}{=} 0$$

$$0 = 0 \checkmark$$

18.  $-r = 38$

$$\frac{-r}{-1} = \frac{38}{-1}$$

$$r = -38$$

Check:  $-r = 38$

$$-(-38) \stackrel{?}{=} 38$$

$$38 = 38 \checkmark$$

20.  $\frac{c}{-2} = -91$

$$(-2)\left(\frac{c}{-2}\right) = (-2)(-91)$$

$$c = 182$$

Check:  $\frac{c}{-2} = -91$

$$\frac{182}{-2} \stackrel{?}{=} -91$$

$$-91 = -91 \checkmark$$

13.  $\frac{y}{-3} = 8$

$$(-3)\left(\frac{y}{-3}\right) = (-3)8$$

$$y = -24$$

Check:  $\frac{y}{-3} = 8$

$$\frac{-24}{-3} \stackrel{?}{=} 8$$

$$8 = 8 \checkmark$$

15.  $-7 = \frac{q}{11}$

$$11(-7) = 11\left(\frac{q}{11}\right)$$

$$-77 = q$$

Check:  $-7 = \frac{q}{11}$

$$-7 \stackrel{?}{=} \frac{-77}{11}$$

$$-7 = -7$$

17.  $-95 = -5b$

$$\frac{-95}{-5} = \frac{-5b}{-5}$$

$$19 = b$$

Check:  $-95 = -5b$

$$-95 \stackrel{?}{=} -5(19)$$

$$-95 = -95 \checkmark$$

19.  $301 = 43s$

$$\frac{301}{43} = \frac{43s}{43}$$

$$7 = s$$

Check:  $301 = 43s$

$$301 \stackrel{?}{=} 43(7)$$

$$301 = 301 \checkmark$$

21.  $17 = \frac{d}{17}$

$$17 \cdot 17 = 17 \cdot \frac{d}{17}$$

$$289 = d$$

Check:  $17 = \frac{d}{17}$

$$17 \stackrel{?}{=} \frac{289}{17}$$

$$17 = 17 \checkmark$$

22.  $9 = \frac{m}{-36}$

$$(-36)9 = (-36)\left(\frac{m}{-36}\right)$$

$$-324 = m$$

Check:  $9 = \frac{m}{-36}$

$$9 \stackrel{?}{=} \frac{-324}{-36}$$

$$9 = 9 \checkmark$$

23.  $\frac{n}{62} = -54$

$$62 \cdot \frac{n}{62} = 62(-54)$$

$$n = -3348$$

Check:  $\frac{n}{62} = -54$

$$\frac{-3348}{62} \stackrel{?}{=} -54$$

$$-54 = -54 \checkmark$$

24. Let  $x$  = the total rushing yards.

$$\text{Average rushing yards per game} = \frac{\text{Total rushing yards}}{\text{Number of games played}}$$

$$81 = \frac{x}{16}$$

$$16 \cdot 81 = 16 \cdot \frac{x}{16}$$

$$1296 = x$$

Michael Bennett rushed 1296 yards.

25. Let  $t$  = the time drilling.

$$\text{Thickness of ice} = \text{Rate of drill} \times \text{Time drilling}$$

$$75 = 15t$$

$$\frac{75}{15} = \frac{15t}{15}$$

$$5 = t$$

It takes 5 minutes to drill through the sheet of ice.

26. Let  $x$  = the number of seedlings planted.

$$\text{Number of seedlings per acre} = \frac{\text{Number of seedlings}}{\text{Number of acres}}$$

$$300 = \frac{x}{100}$$

$$100 \cdot 300 = 100 \cdot \frac{x}{100}$$

$$30,000 = x$$

So, 30,000 seedlings were planted.

27. Let  $t$  = the download time.

$$\text{Download speed} \times \text{Download time} = \text{Size of song file}$$

$$\text{Dial up: } 7t = 3584$$

$$\frac{7t}{7} = \frac{3584}{7}$$

$$t = 512$$

It takes 512 seconds, or 8 minutes 32 seconds, to download using dial-up service.

—CONTINUED—

## Chapter 2 *continued*

### 27. —CONTINUED—

$$\text{DSL: } 96t = 3584$$

$$\frac{96t}{96} = \frac{3584}{96}$$

$$t \approx 37$$

It takes about 37 seconds to download using DSL service.

$$\text{Cable: } 188t = 3584$$

$$\frac{188t}{188} = \frac{3584}{188}$$

$$t \approx 19$$

It takes about 19 seconds to download using cable service.

### 28. $7x - 3x = 24$

$$4x = 24$$

$$\frac{4x}{4} = \frac{24}{4}$$

$$x = 6$$

$$\text{Check: } 7x - 3x = 24$$

$$7(6) - 3(6) \stackrel{?}{=} 24$$

$$42 - 18 \stackrel{?}{=} 24$$

$$24 = 24 \checkmark$$

### 29. $-110 = 12y + 10y$

$$-110 = 22y$$

$$\frac{-110}{22} = \frac{22y}{22}$$

$$-5 = y$$

$$\text{Check: } -110 = 12y + 10y$$

$$-110 \stackrel{?}{=} 12(-5) + 10(-5)$$

$$-110 \stackrel{?}{=} -60 + (-50)$$

$$-110 = -110 \checkmark$$

### 30. $-4(9g) = 252$

$$-36g = 252$$

$$\frac{-36g}{-36} = \frac{252}{-36}$$

$$g = -7$$

$$\text{Check: } -4(9g) = 252$$

$$-4[9(-7)] \stackrel{?}{=} 252$$

$$-4(-63) \stackrel{?}{=} 252$$

$$252 = 252 \checkmark$$

### 31. $150 = 6(5h)$

$$150 = 30h$$

$$\frac{150}{30} = \frac{30h}{30}$$

$$5 = h$$

$$\text{Check: } 150 = 6(5h)$$

$$150 \stackrel{?}{=} 6[5(5)]$$

$$150 \stackrel{?}{=} 6(25)$$

$$150 = 150 \checkmark$$

### 32. $-3 = \frac{z}{6 + 11}$

$$-3 = \frac{z}{17}$$

$$17(-3) = 17 \cdot \frac{z}{17}$$

$$-51 = z$$

$$\text{Check: } -3 = \frac{z}{6 + 11}$$

$$-3 \stackrel{?}{=} \frac{-51}{6 + 11}$$

$$-3 \stackrel{?}{=} \frac{-51}{17}$$

$$-3 = -3 \checkmark$$

### 33. $\frac{w}{8} = 9 - (-4)$

$$\frac{w}{8} = 9 + 4$$

$$\frac{w}{8} = 13$$

$$8 \cdot \frac{w}{8} = 8 \cdot 13$$

$$w = 104$$

$$\text{Check: } \frac{w}{8} = 9 - (-4)$$

$$\frac{104}{8} \stackrel{?}{=} 9 - (-4)$$

$$13 \stackrel{?}{=} 9 + 4$$

$$13 = 13 \checkmark$$

### 34. a. $A = \text{Area of rectangle} + \text{Area of triangle}$

$$= \ell w + \frac{1}{2}bh$$

$$= x \cdot 8 + \frac{1}{2} \cdot x \cdot 6$$

$$= 8x + \frac{1}{2} \cdot 6 \cdot x$$

$$= 8x + 3x$$

$$= 11x$$

### b. Let $A = 154$ square feet.

$$A = 11x$$

$$154 = 11x$$

$$\frac{154}{11} = \frac{11x}{11}$$

$$14 = x$$

When  $A = 154$ ,  $x = 14$  feet.

### 35. a. Let $x =$ the number of days.

$$d = rt$$

$$d = 100x$$

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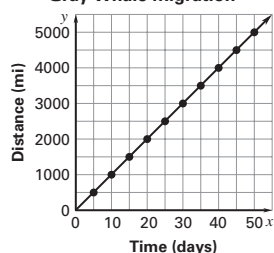
## Chapter 2 *continued*

35. —CONTINUED—

b.

<b>Travel time (days)</b>	0	5	10	15	20	25
<b>Distance traveled (miles)</b>	0	500	1000	1500	2000	2500

c–d. **Gray Whale Migration**



c. *Sample answer:* The points all lie on a straight line that passes through the origin.

d. It takes 50 days for the whales to migrate from the Baja Peninsula to Alaska.

e.  $100x = 5000$

$$\frac{100x}{100} = \frac{5000}{100}$$

$$x = 50$$

The answers are the same.

36. Let  $x$  = the number of columns.

Number of rows  $\times$  Number of columns = Number of pixels

$$80x = 6240$$

$$\frac{80x}{80} = \frac{6240}{80}$$

$$x = 78$$

The viewfinder has 78 columns.

37. *Sample answer:* The Montoyas expect to average 50 miles per hour on their trip to the coast. If it is 400 miles to the coast, how long will the trip take?

Let  $x$  = the time in hours.

$$rt = d$$

$$50x = 400$$

$$\frac{50x}{50} = \frac{400}{50}$$

$$x = 8$$

It will take 8 hours for the trip.

38. Let  $x$  = the number of lightning strikes detected.

$$24 \text{ hours} = 24 \text{ hours} \cdot \frac{60 \text{ minutes}}{1 \text{ hour}} = 1440 \text{ minutes}$$

$$\text{Lightning strikes per minute} = \frac{\text{Number of lightning strikes}}{\text{Number of minutes}}$$

$$80 = \frac{x}{1440}$$

$$1440 \cdot 80 = 1440 \cdot \frac{x}{1440}$$

$$115,200 = x$$

There were 115,200 lightning strikes.

39. a. Let  $x$  = the amount of wheat (in tou) replaced by the goat's owner.

The amount replaced by the horse's owner is  $2x$ .

The amount replaced by the cow's owner is  $2(2x) = 4x$ .

b.  $x + 2x + 4x = 5$

$$7x = 5$$

$$\frac{7x}{7} = \frac{5}{7}$$

$$x = \frac{5}{7} \approx 0.714$$

$$2x \approx 2(0.714) \approx 1.4$$

$$4x \approx 2(0.714) \approx 2.9$$

The goat's owner should replace 0.7 tou. The horse's owner should replace 1.4 tou. The cow's owner should replace 2.9 tou.

### 2.6 Mixed Review (p. 101)

40. 
$$\begin{array}{r} 2.9 \\ + 8.4 \\ \hline 11.3 \end{array}$$

42. 
$$\begin{array}{r} 13.8 \\ - 9.3 \\ \hline 4.5 \end{array}$$

44. 
$$\begin{array}{r} 4.6 \\ \times 2.3 \\ \hline 138 \\ 92 \\ \hline 10.58 \end{array}$$

46. 
$$\begin{array}{r} 6.7 \overline{)53.6} \\ \underline{8} \phantom{0} \\ 67 \overline{)536} \\ \underline{536} \\ 0 \end{array}$$

$$53.6 \div 6.7 = 8$$

41. 
$$\begin{array}{r} 7.63 \\ + 5.18 \\ \hline 12.81 \end{array}$$

43. 
$$\begin{array}{r} 3.239 \\ - 1.740 \\ \hline 1.499 \end{array}$$

45. 
$$\begin{array}{r} 6.51 \\ \times 9.22 \\ \hline 1302 \\ 1302 \\ 5859 \\ \hline 60.0222 \end{array}$$

47. 
$$\begin{array}{r} 3.4 \overline{)8.16} \\ \underline{8} \phantom{0} \\ 34 \overline{)81.6} \\ \underline{68} \\ 136 \\ \underline{136} \\ 0 \end{array}$$

$$8.16 \div 3.4 = 2.4$$

48.  $-19 + 40 = 21$

49.  $-26 + (-7) = -33$

50.  $3 - 18 = 3 + (-18) = -15$

51.  $-12 - (-10) = -12 + 10 = -2$

52.  $5(-14) = -70$

53.  $-23(-8) = 184$

## Chapter 2 *continued*

54.  $-90 \div 15 = -6$       55.  $-36 \div (-4) = 9$   
 56. Let  $x$  = the number of endangered plant species in 1994.

Number in 1994 + Increase = Number in 2001

$$x + 177 = 593$$

$$x + 177 - 177 = 593 - 177$$

$$x = 416$$

There were 416 endangered plant species in 1994.

### 2.6 Standardized Test Practice (p. 101)

57. D;  $\frac{x}{-2} = -8$   
 $(-2)\left(\frac{x}{-2}\right) = (-2)(-8)$   
 $x = 16$

58. H; Let  $x$  = the number of miles per gallon.

Number of gallons  $\times$  Number of miles per gallon = Number of miles

$$12x = 420$$

$$\frac{12x}{12} = \frac{420}{12}$$

$$x = 35$$

The car got 35 miles per gallon.

### Lesson 2.7

#### 2.7 Checkpoint (pp. 103–104)

- $-1.3 + (-4.2) = -5.5$
- $10.57 + (-6.89) = 3.68$
- $9.817 - (-1.49) = 9.817 + 1.49 = 11.307$
- $3.1(-6.8) = -21.08$
- $-11.41 \div (-0.7) = 16.3$
- $-15.841 \div 2.17 = -7.3$

7. *Sample answer:* To check whether your answer is reasonable, round the factors to their nearest whole numbers.

$$3.1 \approx 3$$

$$-6.8 \approx -7$$

$$3(-7) = -21$$

Because  $-21$  is close to  $-21.08$ , the answer is reasonable.

8.  $x + 3.8 = 5.2$   
 $x + 3.8 - 3.8 = 5.2 - 3.8$   
 $x = 1.4$

Check:  $x + 3.8 = 5.2$

$$1.4 + 3.8 \stackrel{?}{=} 5.2$$

$$5.2 = 5.2 \checkmark$$

9.  $a + 10.4 = -1.17$   
 $a + 10.4 - 10.4 = -1.17 - 10.4$   
 $a = -11.57$

Check:  $a + 10.4 = -1.17$

$$-11.57 + 10.4 \stackrel{?}{=} -1.17$$

$$-1.17 = -1.17 \checkmark$$

10.  $6.29 + c = 4.01$   
 $6.29 - 6.29 + c = 4.01 - 6.29$   
 $c = -2.28$

Check:  $6.29 + c = 4.01$

$$6.29 + (-2.28) \stackrel{?}{=} 4.01$$

$$4.01 = 4.01 \checkmark$$

11.  $y - 7.8 = 22.3$   
 $y - 7.8 + 7.8 = 22.3 + 7.8$   
 $y = 30.1$

Check:  $y - 7.8 = 22.3$

$$30.1 - 7.8 \stackrel{?}{=} 22.3$$

$$22.3 = 22.3 \checkmark$$

12.  $r - 0.88 = -0.56$   
 $r - 0.88 + 0.88 = -0.56 + 0.88$   
 $r = 0.32$

Check:  $r - 0.88 = -0.56$

$$0.32 - 0.88 \stackrel{?}{=} -0.56$$

$$-0.56 = -0.56 \checkmark$$

13.  $-9.34 = t - 2.75$   
 $-9.34 + 2.75 = t - 2.75 + 2.75$   
 $-6.59 = t$

Check:  $-9.34 = t - 2.75$

$$-9.34 \stackrel{?}{=} -6.59 - 2.75$$

$$-9.34 = -9.34 \checkmark$$

14.  $7x = 40.6$

$$\frac{7x}{7} = \frac{40.6}{7}$$

$$x = 5.8$$

Check:  $7x = 40.6$

$$7(5.8) \stackrel{?}{=} 40.6$$

$$40.6 = 40.6 \checkmark$$

15.  $-1.8u = 6.3$

$$\frac{-1.8u}{-1.8} = \frac{6.3}{-1.8}$$

$$u = -3.5$$

Check:  $-1.8u = 6.3$

$$-1.8(-3.5) \stackrel{?}{=} 6.3$$

$$6.3 = 6.3 \checkmark$$

## Chapter 2 continued

$$16. \quad \frac{y}{11.5} = 0.4$$

$$11.5 \cdot \frac{y}{11.5} = 11.5 \cdot 0.4$$

$$y = 4.6$$

$$\text{Check: } \frac{y}{11.5} = 0.4$$

$$\frac{4.6}{11.5} \stackrel{?}{=} 0.4$$

$$0.4 = 0.4 \quad \checkmark$$

$$17. \quad -9.1 = \frac{v}{-5.9}$$

$$(-5.9)(-9.1) = (-5.9)\left(\frac{v}{-5.9}\right)$$

$$53.69 = v$$

$$\text{Check: } -9.1 = \frac{v}{-5.9}$$

$$-9.1 \stackrel{?}{=} \frac{53.69}{-5.9}$$

$$-9.1 = -9.1 \quad \checkmark$$

18. Let  $x$  = the balance before the deposit.

$$\begin{array}{r} \text{Balance before} \\ \text{deposit} \end{array} + \text{Deposit} = \begin{array}{r} \text{Balance after} \\ \text{deposit} \end{array}$$

$$x + 122.94 = 286.59$$

$$x + 122.94 - 122.94 = 286.59 - 122.94$$

$$x = 163.65$$

Before the deposit you had a balance of \$163.65

### 2.7 Guided Practice (p. 105)

- The sum of a positive decimal and a negative decimal has the same sign as the decimal with the greater *absolute value*.
- Sample Answer:* To solve the equation  $-7.9x = 86.9$ , divide each side of the operation by  $-7.9$  to get  $x$  alone on one side of the equation.

$$\frac{-7.9x}{-7.9} = \frac{86.9}{-7.9}$$

$$x = 11$$

$$3. \quad -6.2 + 4.5 = -1.7$$

$$4. \quad 1.9 - (-9.1) = 1.9 + 9.1 = 11$$

$$5. \quad -0.4(-8.3) = 3.32$$

$$6. \quad 7.35 \div (-2.1) = -3.5$$

$$7. \quad x - 2.2 = 3.2$$

$$x - 2.2 + 2.2 = 3.2 + 2.2$$

$$x = 5.4$$

$$\text{Check: } x - 2.2 = 3.2$$

$$5.4 - 2.2 \stackrel{?}{=} 3.2$$

$$3.2 = 3.2 \quad \checkmark$$

$$8. \quad y + 0.6 = -1$$

$$y + 0.6 - 0.6 = -1 - 0.6$$

$$y = -1.6$$

$$\text{Check: } y + 0.6 = -1$$

$$-1.6 + 0.6 \stackrel{?}{=} -1$$

$$-1 = -1 \quad \checkmark$$

$$9. \quad \frac{n}{-7.1} = 5.8$$

$$(-7.1)\left(\frac{n}{-7.1}\right) = (-7.1)5.8$$

$$n = -41.18$$

$$\text{Check: } \frac{n}{-7.1} = 5.8$$

$$\frac{-41.18}{-7.1} \stackrel{?}{=} 5.8$$

$$5.8 = 5.8 \quad \checkmark$$

$$10. \quad -5.2a = -1.3$$

$$\frac{-5.2a}{-5.2} = \frac{-1.3}{-5.2}$$

$$a = 0.25$$

$$\text{Check: } -5.2a = -1.3$$

$$-5.2(0.25) \stackrel{?}{=} -1.3$$

$$-1.3 = -1.3 \quad \checkmark$$

$$11. (1) \quad -0.19 + (-0.28) + 0.04 + (-0.18) = -0.61$$

The overall change is  $-0.61$  meter.

$$(2) \quad \text{Let } x = \text{the water level in 1997.}$$

$$\begin{array}{r} \text{Water level} \\ \text{in 1997} \end{array} + \begin{array}{r} \text{Decrease in} \\ \text{water level} \end{array} = \begin{array}{r} \text{Water level} \\ \text{in 2001} \end{array}$$

$$x + (-0.61) = 182.98$$

$$x - 0.61 = 182.98$$

$$(3) \quad x - 0.61 = 182.98$$

$$x - 0.61 + 0.61 = 182.98 + 0.61$$

$$x = 183.59$$

Lake Superior's water level in 1997 was 183.59 meters.

### 2.7 Practice and Problem Solving (pp. 105–107)

$$12. \quad 7.8 + (-9.3) = -1.5$$

$$13. \quad -1.25 + 14.4 = 13.15$$

$$14. \quad -2.583 + (-5.399) = -7.982$$

$$15. \quad 6.1 - 18.7 = 6.1 + (-18.7) = -12.6$$

$$16. \quad -3.72 - 4.58 = -3.72 + (-4.58) = -8.3$$

$$17. \quad -0.62 - (-0.741) = -0.62 + 0.741 = 0.121$$

$$18. \quad -4.8(0.1) = -0.48$$

$$19. \quad -11.7(-6.82) = 79.794$$

$$20. \quad 2.03(-1.66) = -3.3698$$

$$21. \quad 34.1 \div (-5.5) = -6.2$$

$$22. \quad -0.63 \div 0.7 = -0.9$$

## Chapter 2 *continued*

23.  $-7.532 \div (-2.69) = 2.8$

24.  $x + 8.5 = 13.7$   
 $x + 8.5 - 8.5 = 13.7 - 8.5$   
 $x = 5.2$

Check:  $x + 8.5 = 13.7$   
 $5.2 + 8.5 \stackrel{?}{=} 13.7$   
 $13.7 = 13.7 \checkmark$

25.  $a + 4.8 = 2.29$   
 $a + 4.8 - 4.8 = 2.29 - 4.8$   
 $a = -2.51$

Check:  $a + 4.8 = 2.29$   
 $-2.51 + 4.8 \stackrel{?}{=} 2.29$   
 $2.29 = 2.29 \checkmark$

26.  $-3.36 = b + 5.12$   
 $-3.36 - 5.12 = b + 5.12 - 5.12$   
 $-8.48 = b$

Check:  $-3.36 = b + 5.12$   
 $-3.36 \stackrel{?}{=} -8.48 + 5.12$   
 $-3.36 = -3.36 \checkmark$

27.  $y - 1.3 = -7.4$   
 $y - 1.3 + 1.3 = -7.4 + 1.3$   
 $y = -6.1$

Check:  $y - 1.3 = -7.4$   
 $-6.1 - 1.3 \stackrel{?}{=} -7.4$   
 $-7.4 = -7.4 \checkmark$

28.  $g - 6.27 = 10.63$   
 $g - 6.27 + 6.27 = 10.63 + 6.27$   
 $g = 16.9$

Check:  $g - 6.27 = 10.63$   
 $16.9 - 6.27 \stackrel{?}{=} 10.63$   
 $10.63 = 10.63 \checkmark$

29.  $-0.504 + h = -0.18$   
 $-0.504 + 0.504 + h = -0.18 + 0.504$   
 $h = 0.324$

Check:  $-0.504 + h = -0.18$   
 $-0.504 + 0.324 \stackrel{?}{=} -0.18$   
 $-0.18 = -0.18 \checkmark$

30.  $8w = 75.2$

$$\frac{8w}{8} = \frac{75.2}{8}$$

$w = 9.4$

Check:  $8w = 75.2$   
 $8(9.4) \stackrel{?}{=} 75.2$   
 $75.2 = 75.2 \checkmark$

31.  $-0.96j = -0.72$

$$\frac{-0.96j}{-0.96} = \frac{-0.72}{-0.96}$$

$j = 0.75$

Check:  $-0.96j = -0.72$   
 $-0.96(0.75) \stackrel{?}{=} -0.72$   
 $-0.72 = -0.72 \checkmark$

32.  $3.498 = -0.53k$

$$\frac{3.498}{-0.53} = \frac{-0.53k}{-0.53}$$

$-6.6 = k$

Check:  $3.498 = -0.53k$   
 $3.498 \stackrel{?}{=} -0.53(-6.6)$   
 $3.498 = 3.498 \checkmark$

33.  $\frac{z}{6.9} = -3$

$$6.9 \cdot \frac{z}{6.9} = 6.9(-3)$$

$z = -20.7$

Check:  $\frac{z}{6.9} = -3$   
 $\frac{-20.7}{6.9} \stackrel{?}{=} -3$   
 $-3 = -3 \checkmark$

34.  $\frac{r}{0.4} = 0.8$

$$0.4 \cdot \frac{r}{0.4} = 0.4 \cdot 0.8$$

$r = 0.32$

Check:  $\frac{r}{0.4} = 0.8$   
 $\frac{0.32}{0.4} \stackrel{?}{=} 0.8$   
 $0.8 = 0.8 \checkmark$

35.  $-9.1 = \frac{s}{-7.12}$

$$-7.12(-9.1) = -7.12\left(\frac{s}{-7.12}\right)$$

$64.792 = s$

Check:  $-9.1 = \frac{s}{-7.12}$   
 $-9.1 \stackrel{?}{=} \frac{64.792}{-7.12}$   
 $-9.1 = -9.1 \checkmark$

36.

X	Y <sub>1</sub>
0.9	3.33
1	3.7
1.1	4.07
1.2	4.44
1.3	4.81
1.4	5.18

X=1.3

4.81 corresponds to an  $x$ -value of 1.3. So, the solution of  $3.7x = 4.81$  is 1.3.





## Chapter 2 *continued*

### 47. —CONTINUED—

b. Let  $t$  = the time in hours.

$$d = rt$$

$$550 = rt$$

$$\text{Cessna Skyhawk: } 550 = 141t$$

$$\frac{550}{141} = \frac{141t}{141}$$

$$3.9 \approx t$$

The Cessna Skyhawk will take about 3.9 hours.

$$\text{Boeing 747: } 550 = 570t$$

$$\frac{550}{570} = \frac{570t}{570}$$

$$1.0 \approx t$$

The Boeing 747 will take about 1.0 hour.

$$\text{Concorde: } 550 = 1346t$$

$$\frac{550}{1346} = \frac{1346t}{1346}$$

$$0.4 \approx t$$

The Concorde will take about 0.4 hour.

### 2.7 Mixed Review (p. 107)

48.  $5x + 11 + 8x$

Terms:  $5x$ ,  $11$ ,  $8x$

Like terms:  $5x$  and  $8x$

Coefficients:  $5$ ,  $8$

Constant term:  $11$

$$5x + 11 + 8x = 5x + 8x + 11$$

$$= (5 + 8)x + 11$$

$$= 13x + 11$$

49.  $-3p + 2 + p - 4 = -3p + 2 + p + (-4)$

Terms:  $-3p$ ,  $2$ ,  $p$ ,  $-4$

Like terms:  $-3p$  and  $p$ ;  $2$  and  $-4$

Coefficients:  $-3$ ,  $1$

Constant terms:  $2$ ,  $-4$

$$-3p + 2 + p + (-4) = -3p + p + 2 + (-4)$$

$$= (-3 + 1)p + 2 + (-4)$$

$$= -2p + (-2)$$

$$= -2p - 2$$

50.  $7w - w + 9 - 6w = 7w + (-w) + 9 + (-6w)$

Terms:  $7w$ ,  $-w$ ,  $9$ ,  $-6w$

Like terms:  $7w$ ,  $-w$ , and  $-6w$

Coefficients:  $7$ ,  $-1$ ,  $-6$

Constant term:  $9$

$$7w + (-w) + 9 + (-6w)$$

$$= 7w + (-w) + (-6w) + 9$$

$$= [7 + (-1) + (-6)]w + 9$$

$$= 0w + 9$$

$$= 9$$

51.  $8 + 2y - 1 - 9y + 3 = 8 + 2y + (-1) + (-9y) + 3$

Terms:  $8$ ,  $2y$ ,  $-1$ ,  $-9y$ ,  $3$

Like terms:  $2y$  and  $-9y$ ;  $8$ ,  $-1$ , and  $3$

Coefficients:  $2$ ,  $-9$

Constant terms:  $8$ ,  $-1$ ,  $3$

$$8 + 2y + (-1) + (-9y) + 3$$

$$= 2y + 8 + (-9y) + (-1) + 3$$

$$= 2y + (-9y) + 8 + (-1) + 3$$

$$= [2 + (-9)]y + 8 + (-1) + 3$$

$$= -7y + 10$$

52.  $x + 12 = 5$

$$x + 12 - 12 = 5 - 12$$

$$x = -7$$

Check:  $x + 12 = 5$

$$-7 + 12 \stackrel{?}{=} 5$$

$$5 = 5 \checkmark$$

53.  $y - 9 = -4$

$$y - 9 + 9 = -4 + 9$$

$$y = 5$$

Check:  $y - 9 = -4$

$$5 - 9 \stackrel{?}{=} -4$$

$$-4 = -4 \checkmark$$

54.  $32c = 192$

$$\frac{32c}{32} = \frac{192}{32}$$

$$c = 6$$

Check:  $32c = 192$

$$32(6) \stackrel{?}{=} 192$$

$$192 = 192 \checkmark$$

55.  $\frac{d}{19} = -8$

$$19 \cdot \frac{d}{19} = 19(-8)$$

$$d = -152$$

Check:  $\frac{d}{19} = -8$

$$\frac{-152}{19} \stackrel{?}{=} -8$$

$$-8 = -8 \checkmark$$

### 2.7 Standardized Test Practice (p. 107)

56. a.  $s = 3.49T$

$$s = 3.49(11) = 38.39$$

The speed of the waves is 38.39 miles per hour.

—CONTINUED—