

Practice 2-1**Properties of Numbers**
.....**Simplify each expression using mental math.**

1. $4 \cdot 13 \cdot 25$

2. $700 + 127 + 300$

3. $68 + 85 + 32$

4. $2 \cdot 3 \cdot 4 \cdot 5$

5. $-14 + 71 + 29 + (-86)$

6. $125 \cdot 9 \cdot 8$

7. $20 \cdot 7 \cdot 5$

8. $217 + 545 - 17$

9. $39 + 27 + 11$

10. $4 \cdot 12 \cdot 250$

11. $19 + 0 + (-9)$

12. $-6 \cdot 1 \cdot 30$

Write the letter of the property shown.

13. $14(mn) = (14m)n$ _____

14. $19 + 11 = 11 + 19$ _____

15. $k \cdot 1 = k$ _____

16. $(x + y) + z = x + (y + z)$ _____

17. $65t = t(65)$ _____

18. $p = 0 + p$ _____

19. $n = 1 \cdot n$ _____

20. $(x + p) + (r + t) = (r + t) + (x + p)$ _____

21. $(h + 0) + 4 = h + 4$ _____

22. $x + yz = x + zy$ _____

- a. commutative property of addition
- b. associative property of addition
- c. commutative property of multiplication
- d. associative property of multiplication
- e. additive identity
- f. multiplicative identity

Evaluate each expression using mental math.

23. $x(yz)$, for $x = 8, y = -9, z = 5$ _____

24. $q + r + s$, for $q = 46, r = 19, s = 54$ _____

25. $a(b)(-c)$, for $a = 7, b = -2, c = 15$ _____

Practice 2-2

The Distributive Property

Write an expression using parentheses for each model. Then multiply.



Multiply each expression.

3. $6(h - 4)$ _____

4. $(p + 3)5$ _____

5. $-3(x + 8)$ _____

6. $(4 - y)(-9)$ _____

7. $2(7n - 11)$ _____

8. $-10(-a + 5)$ _____

Use the distributive property to simplify.

9. $98 \cdot 7$ _____

10. $9 \cdot 28$ _____

11. $78 \cdot 8$ _____

12. $7(2,009)$ _____

13. $899 \cdot 5$ _____

14. $30 \cdot 105$ _____

15. $8 \cdot 5 - 12 \cdot 5$ _____

16. $7 \cdot 10 + 7(-3)$ _____

17. $-4(3) + (-4)(6)$ _____

18. $6(8) + 6(-2)$ _____

Solve using mental math.

19. A shipping container holds 144 boxes. How many boxes can be shipped in 4 containers? _____

Practice 2-3

Simplifying Variable Expressions


Simplify each expression.

- | | | |
|--------------------------------------|-------------------------------------|-----------------------------------|
| 1. $16 + 7y - 8$
_____ | 2. $18m - 7 + 12m$
_____ | 3. $5(3t) - 7(2t)$
_____ |
| 4. $2x - 9y + 7x + 20y$
_____ | 5. $3(9k - 4) - 4(5n - 3)$
_____ | 6. $6(g - h) - 6(g - h)$
_____ |
| 7. $-21(a + 2b) + 14a - 9b$
_____ | 8. $-7a + 3(a - c) + 5c$
_____ | 9. $-2(-5)q + (-72)(-q)$
_____ |

Name the coefficients, any like terms, and any constants.

	Coefficients	Like Terms	Constants
10. $3x + 7$	_____	_____	_____
11. $4m + (-3n) + n$	_____	_____	_____
12. $6kp + 9k + kp - 14$	_____	_____	_____
13. $-8y + 6ab + 7 - 3ba$	_____	_____	_____
14. $c + 2c + c - 5c + 1$	_____	_____	_____

Write an expression for each model. Simplify the expression.

15.  _____

16.  _____

Justify each step.

17. $5(n + 4) + 9n = (5n + 20) + 9n$ _____
- $= 5n + (20 + 9n)$ _____
- $= 5n + (9n + 20)$ _____
- $= (5n + 9n) + 20$ _____
- $= (5 + 9)n + 20$ _____
- $= 14n + 20$ _____

Practice 2-4

Variables and Equations

Is the given number a solution of the equation?

1. $9k = 10 - k$; -1 _____

2. $-7r - 15 = -2r$; -3 _____

3. $3g \div (-6) = 5 - g$; -10 _____

4. $-3p = 4p + 35$; -5 _____

5. $8 - e = 2e - 16$; 8 _____

6. $5 - 15s = 8 - 16s$; 3 _____

7. $2(x - 2) - 5x = 5(2 - x)$; 7 _____

8. $6a + 3 = 3(3a - 2)$; 4 _____

Is each equation true, false, or an open sentence?

9. $14 = x - 9$

10. $8 + 7 = 10$

11. $4 - 15 = 22 - 33$

12. $5 + x = 90 \div 9 + 4$

13. $-7(5 - 9) = 19 - 3(-3)$

14. $6(5 - 8) = 2(10 - 1)$

Write an equation for each sentence. Is each equation true, false, or an open sentence?15. One fifth of a number n is equal to -7 .
_____16. The product of 13 and -7 is -91 .
_____17. Fifty-four divided by six equals negative nine.
_____18. Seven less than the product of a number z and 3 is equal to 4.
_____**Write an equation. Is the given value a solution?**19. A truck driver drove 468 miles on Tuesday. That was 132 miles farther than she drove on Monday. Let d represent the distance she drove on Monday. Did she drive 600 miles on Monday?

Practice 2-5**Solving Equations by Adding or Subtracting**
.....**Use mental math to solve each equation.**

1. $-52 = -52 + k$ _____

2. $837 = p + 37$ _____

3. $x - 155 = 15$ _____

4. $180 = 80 + n$ _____

5. $2,000 + y = 9,500$ _____

6. $81 = x - 19$ _____

7. $111 + f = 100$ _____

8. $w - 6 = -16$ _____

Solve each equation.

9. $m - 17 = -8$ _____

10. $k - 55 = 67$ _____

11. $-44 + n = 36$ _____

12. $-36 = p - 91$ _____

13. $x - 255 = 671$ _____

14. $19 = c - (-12)$ _____

15. $x + 14 = 21$ _____

16. $31 = p + 17$ _____

17. $-19 = k + 9$ _____

18. $87 + y = 19$ _____

19. $36 + n = 75$ _____

20. $-176 = h + (-219)$ _____

21. $41 + k = 7$ _____

22. $1,523 + c = 2,766$ _____

23. $-88 + z = 0$ _____

24. $-33 + (-7) = 29 + m$ _____

25. $t + (-2) = -66$ _____

26. $-390 + x = 11 - 67$ _____

27. The combined enrollment in the three grades at Jefferson Middle School is 977. There are 356 students in the seventh grade and 365 in the eighth grade. Write and solve an equation to find how many students are in the ninth grade.

Equation _____

Solution _____

Practice 2-6

Solving Equations by Multiplying or Dividing

Solve each equation.

- | | |
|-------------------------------|-----------------------------------|
| 1. $\frac{k}{-5} = -5$ _____ | 2. $-3 = \frac{n}{7}$ _____ |
| 3. $\frac{x}{12} = 0$ _____ | 4. $-6 = \frac{m}{-2}$ _____ |
| 5. $\frac{y}{-4} = -12$ _____ | 6. $\frac{s}{30} = 6$ _____ |
| 7. $\frac{1}{9}z = 0$ _____ | 8. $-\frac{m}{55} = 1$ _____ |
| 9. $-3x = 18$ _____ | 10. $-56 = 8y$ _____ |
| 11. $8p = -8$ _____ | 12. $-4s = -32$ _____ |
| 13. $14h = 42$ _____ | 14. $-175 = 25g$ _____ |
| 15. $-42 = 6m$ _____ | 16. $-2x = 34$ _____ |
| 17. $\frac{x}{9} = -11$ _____ | 18. $216 = 9w$ _____ |
| 19. $-17v = -17$ _____ | 20. $-161 = 23t$ _____ |
| 21. $56h = 3,136$ _____ | 22. $20 = \frac{e}{-25}$ _____ |
| 23. $4,200 = 30x$ _____ | 24. $\frac{y}{-21} = -21$ _____ |
| 25. $\frac{m}{-3} = 21$ _____ | 26. $4,000 = \frac{x}{-40}$ _____ |

27. A bamboo tree grew 3 in. per day. Write and solve an equation to find how many days d it took the tree to grow 144 in.

Equation: _____ Solution: _____

28. Carl drove 561 miles. His car averages 33 miles per gallon of gas. Write and solve an equation to find how much gas g Carl's car used.

Equation: _____ Solution: _____

For what values of y is each equation true?

29. $-5|y| = -25$

30. $\frac{|y|}{2} = 28$

31. $9|y| = 27$

Practice 2-7

Guess, Check, Revise

Use the guess, check, revise strategy to solve each problem.

1. The length of a rectangle is 9 in. greater than the width. The area is 36 in.² Find the dimensions. _____

Width						
Length						
Area						

2. Shari Williams, a basketball player, scored 30 points on 2-point and 3-point goals. She hit 5 more 2-pointers than 3-pointers. How many of each did she score? _____

3-Pointers						
2-Pointers						
Points						

3. The sums and products of pairs of integers are given. Find each pair of integers.

a. sum = -12, product = 36 _____

b. sum = -12, product = 35 _____

c. sum = -12, product = 32 _____

d. sum = -12, product = 11 _____

e. sum = -12, product = 0 _____

4. Jess had 3 more nickels than dimes for a total of \$1.50. How many of each coin did he have?

5. A brush cost \$2 more than a comb. The brush and a comb together cost \$3.78. Find the cost of each.

6. The hard-cover edition of a book cost 3 times as much as the paperback edition. Both editions together cost \$26.60. Find the cost of each.

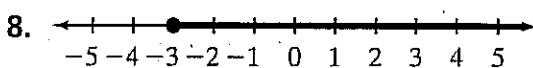
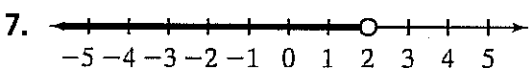
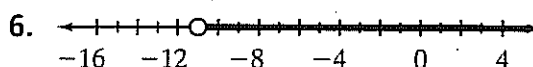
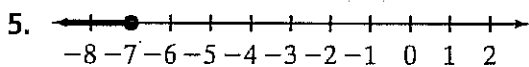
Practice 2-8

Inequalities and Their Graphs

Write an inequality for each sentence.

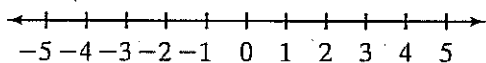
- The total t is less than sixteen. _____
- A number h is not less than 7. _____
- The price p is less than or equal to \$25. _____
- A number n is negative. _____

Write an inequality for each graph.

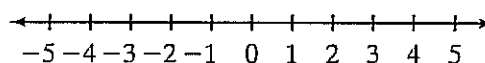


Graph the solutions of each inequality on a number line.

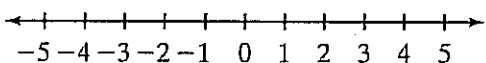
9. $x < -2$



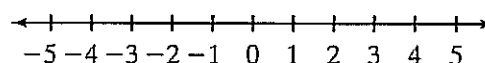
10. $y \geq -1$



11. $k > 1$



12. $p \leq 4$



Write an inequality for each situation.

13. Everyone in the class is under 13 years old. Let x be the age of a person in the class.
- _____

14. The speed limit is 60 miles per hour. Let s be the speed of a car driving within the limit.
- _____

15. You have \$4.50 to spend on lunch. Let c be the cost of your lunch.
- _____

Practice 2-9

Solving One-Step Inequalities by Adding or Subtracting

Write an inequality for each sentence. Then solve the inequality.

- Six less than n is less than -4 .

- The sum of a number k and five is greater than or equal to two.

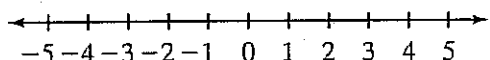
- Nine more than a number b is greater than negative three.

- You must be at least 48 inches tall to ride an amusement park ride, and your little sister is 39 inches tall. How many inches i must she grow before she may ride the ride?

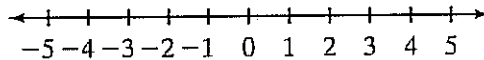
- You need no more than 3,000 calories in a day. You consumed 840 calories at breakfast and 1,150 calories at lunch. How many calories c can you eat for dinner?

Solve each inequality. Graph the solutions.

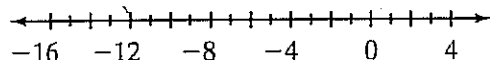
6. $7 + x \geq 9$ _____



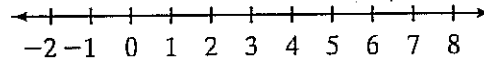
7. $-5 \leq x - 6$ _____



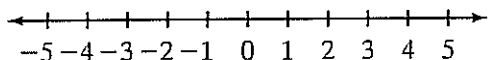
8. $0 \geq x + 12$ _____



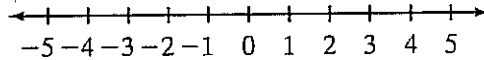
9. $x - 15 \leq -8$ _____



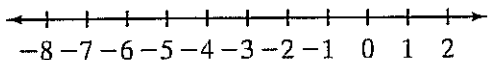
10. $13 + x \geq 13$ _____



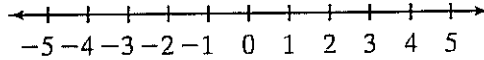
11. $x - 8 > -5$ _____



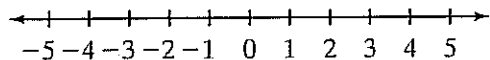
12. $4 + x < -2$ _____



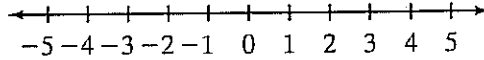
13. $x - 9 > -11$ _____



14. $x - 6 \leq -1$ _____



15. $-4 + x < -4$ _____



Practice 2-10

Solving One-Step Inequalities by Multiplying or Dividing

Write an inequality for each sentence. Then solve the inequality.

1. The product of k and -5 is no more than 30.

2. Half of p is at least -7 .

3. The product of k and 9 is no more than 18.

4. One-third of p is at least -17 .

5. The opposite of g is at least -5 .

Solve each inequality.

6. $-5x < 10$ _____

7. $\frac{x}{4} > 1$ _____

8. $-8 < -8x$ _____

9. $\frac{1}{3}x > -2$ _____

10. $48 \geq -12x$ _____

11. $\frac{1}{3}x < -6$ _____

12. $\frac{x}{5} < -4$ _____

13. $-x \leq 2$ _____

Determine whether each number is a solution of $7 \geq -3k$.

14. 2 _____

15. -2 _____

16. 0 _____

17. -3 _____

Justify each step.

18. $-5n \geq 45$

$$\frac{-5n}{-5} \leq \frac{45}{-5}$$

$$n \leq -9$$

Chapter 2 Answers

Practice 2-1

1. 1,300 2. 1,127 3. 185 4. 120 5. 0
 6. 9,000 7. 700 8. 745 9. 77 10. 12,000
 11. 10 12. -180 13. d 14. a 15. f 16. b
 17. c 18. e 19. f 20. a 21. e 22. c
 23. -360 24. 119 25. 210

Practice 2-2

1. $3(4x + 2) = 12x + 6$ 2. $2(5x + 3) = 10x + 6$ 3. $6h - 24$ 4. $5p + 15$
 5. $-3x - 24$ 6. $-36 + 9y$ 7. $14n - 22$
 8. $10a - 50$ 9. $(100 - 2)7 = 700 - 14 = 686$
 10. $9(30 - 2) = 270 - 18 = 252$ 11. $(80 - 2)8 = 640 - 16 = 624$ 12. $7(2,000 + 9) = 14,000 + 63 = 14,063$ 13. $(900 - 1)5 = 4,500 - 5 = 4,495$ 14. $30(100 + 5) = 3,000 + 150 = 3,150$ 15. $(8 - 12)5 = -20$
 16. $7[10 + (-3)] = 49$ 17. $-4(3 + 6) = -36$
 18. $6[8 + (-2)] = 36$ 19. 576 boxes

Practice 2-3

1. $7y + 8$ 2. $30m - 7$ 3. t 4. $9x + 11y$
 5. $27k - 20n$ 6. 0 7. $-7a - 51b$
 8. $-4a + 2c$ 9. $82q$ 10. 3; none; 7 11. 4, -3, 1; $-3n, n$; none 12. 6, 9, 1; $6kp, kp$; -14
 13. -8, 6, -3; $6ab, -3ba$; 7 14. 1, 2, 1, -5; $c, 2c, c, -5c$; 1 15. $x + 4 + 3x + (-5) + 2x; 6x - 1$ 16. $4x + (-6) + (-2x) + 3x + 1; 5x - 5$ 17. Distributive Property, Associative Property of Addition, Commutative Property of Addition, Associative Property of Addition, Distributive Property, Addition

Practice 2-4

1. no 2. yes 3. no 4. yes 5. yes 6. yes
 7. yes 8. no 9. open sentence 10. false
 11. true 12. open sentence 13. true
 14. false 15. $\frac{1}{3}n = -7$; open sentence
 16. $13(-7) = -91$; true 17. $54 \div 6 = -9$; false
 18. $3z - 7 = 4$; open sentence
 19. $d + 132 = 468$; no

Practice 2-5

1. $k = 0$ 2. $p = 800$ 3. $x = 170$
 4. $n = 100$ 5. $y = 7,500$ 6. $x = 100$

7. $f = -11$ 8. $w = -10$ 9. $m = 9$
 10. $k = 122$ 11. $n = 80$ 12. $p = 55$
 13. $x = 926$ 14. $c = 7$ 15. $x = 7$
 16. $p = 14$ 17. $k = -28$ 18. $y = -68$
 19. $n = 39$ 20. $h = 43$ 21. $k = -34$
 22. $c = 1,243$ 23. $z = 88$ 24. $m = -69$
 25. $t = -64$ 26. $x = 334$
 27. $356 + 365 + n = 977$; 256 students

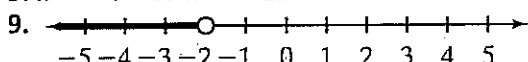
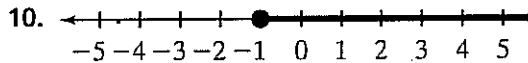
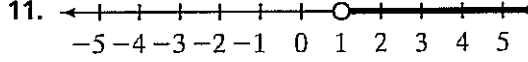
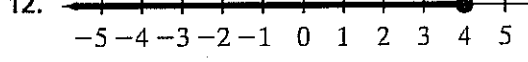
Practice 2-6

1. $k = 25$ 2. $n = -21$ 3. $x = 0$ 4. $m = 12$
 5. $y = 48$ 6. $s = 180$ 7. $z = 0$ 8. $m = -55$
 9. $x = -6$ 10. $y = -7$ 11. $p = -1$
 12. $s = 8$ 13. $h = 3$ 14. $g = -7$
 15. $m = -7$ 16. $x = -17$ 17. $x = 99$
 18. $w = 24$ 19. $v = 1$ 20. $t = -7$
 21. $h = 56$ 22. $e = -500$ 23. $x = 140$
 24. $y = 441$ 25. $m = -63$ 26. $x = -160,000$
 27. $3d = 144$; 48 days 28. $33g = 561$; 17 gallons
 29. -5, 5 30. -56, 56 31. -3, 3

Practice 2-7

1. 3 in. by 12 in.; Sample guesses are shown. 1, 2, 3; 10, 11, 12; 10, 22, 36 2. 4 3-pointers and 9 2-pointers; Sample guesses are shown. 1, 2, 3, 4; 6, 7, 8, 9; 15, 20, 25, 30 3.a. -6, -6 b. -7, -5 c. -8, -4 d. -11, -1 e. -12, 0 4. 9 dimes; 12 nickels 5. brush \$2.89; comb \$.89 6. paperback \$6.65; hard cover \$19.95

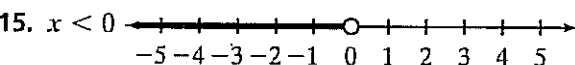
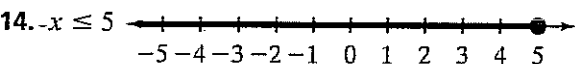
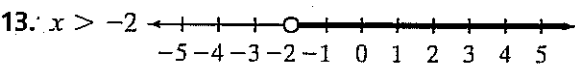
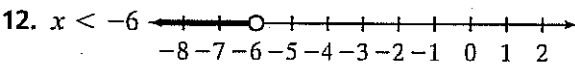
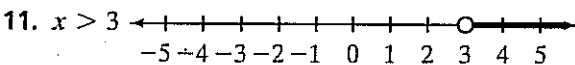
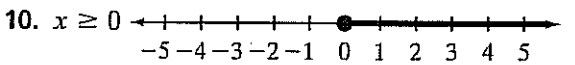
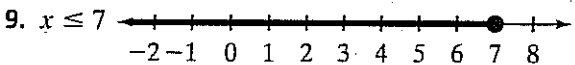
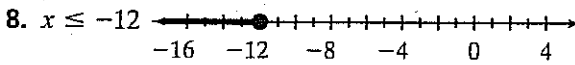
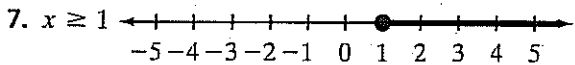
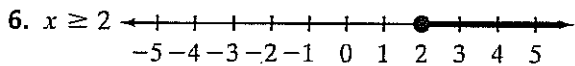
Practice 2-8

1. $t < 16$ 2. $h \geq 7$ 3. $p \leq 25$ 4. $n < 0$
 5. $x \leq -7$ 6. $x > -11$ 7. $x < 2$ 8. $x \geq -3$
 9. 
 10. 
 11. 
 12. 
 13. $x < 13$ 14. $s \leq 60$ 15. $c \leq \$4.50$

Practice 2-9

1. $n - 6 < -4; n < 2$ 2. $k + 5 \geq 2; k \geq -3$
 3. $b + 9 > -3; b > -12$ 4. $39 + i \geq 48; i \geq 9$
 5. $840 + 1,150 + c \leq 3,000; c \leq 1,010$

Chapter 2 Answers (continued)



13. $8n + 5$ 14. $-6p$

Reteaching 2-4

- $60t = 180$; No, it did not take 4 hours.
- $20 = p + 8$; Yes, Mike scored 12 points.
- $\frac{q}{4} = 5$; Yes, you started with 20 quarts.
- $12w = 600$; No, you cannot type 60 words in one minute.

Reteaching 2-5

- $m = 4$
- $y = 77$
- $t = -18$
- $z = 9$
- $r = -23$
- $p = 109$
- $g = -66$
- $y = 592$
- $b = 0$
- $s = -17$
- $k = 26$
- $f = 22$
- $z = 40$
- $a = -101$
- $n = 33$
- $h = -6$

Reteaching 2-6

- $m = 5$
- $b = -24$
- $k = 9$
- $n = 14$
- $n = -5$
- $p = 75$
- $y = 0$
- $m = -48$
- $a = -1$
- $z = -64$
- $t = -2$
- $j = 11$
- $r = -91$
- $c = -765$
- $w = 69$
- $g = 5$

Reteaching 2-7

1. 6 field goals and 4 touchdowns; Sample guesses are shown. 1, 3, 6, 9, 15; 2, 4, 12, 12, 24; 3, 5, 18, 15, 33; 4, 6, 24, 18, 42

Reteaching 2-8

- $x \geq -2$
- $x \leq -3$
- $x < 6$
- $x > -5$
- $x \geq 4$
- $x > 0$
- $x < -1$
- $x \geq 2$
- $x > 3$
- $x \leq 0$

Reteaching 2-9

- $k - 8 < 5$; $k < 13$
- $9 + x \geq -2$; $x \geq -11$
- $p - 5 \leq -10$; $p \leq -5$
- $d + 17 < 25$; $d < 8$
- $s + 6 > -7$; $s > -13$
- $y - 10 < 20$; $y < 30$
- $82 + j \geq -28$; $j \geq -110$
- $n - 9 \leq -23$; $n \leq -14$
- $h - 19 > 3$; $h > 22$

Reteaching 2-10

- $n \geq 6$
- $m > -9$
- $x > 21$
- $y \leq 32$
- $q > -10$
- $n \leq -2$
- $k \geq 9$
- $d \leq 42$
- $r > -108$
- $h < 39$
- $z \geq 5$
- $f \leq -\frac{27}{2}$

Practice 2-10

- $-5k \leq 30$; $k \geq -6$
- $\frac{1}{2}p \geq -7$; $p \geq -14$
- $9k \leq 18$; $k \leq 2$
- $\frac{1}{3}p \geq -17$; $p \geq -51$
- $-g \geq -5$; $g \leq 5$
- $x > -2$
- $x > 4$
- $x < 1$
- $x > -6$
- $x \geq -4$
- $x < -18$
- $x < -20$
- $x \geq -2$
- yes
- yes
- yes
- no
- Divide each side by -5 and reverse the direction of the inequality symbol; Simplify.

Reteaching 2-1

- 515
- 27
- 700
- 60
- 21
- 360
- 24
- 1,425
- 1,300
- 276
- 45
- 353,000

Reteaching 2-2

- 12
- 3, 7
- z, b, z, c
- 7, (-3)
- $(-3), p, n$
- $4x + 20$
- $4m - 24$
- $st - 6s$
- $8j - 16k + 8l$
- $20 - 5z$
- $-63 - 9y$

Reteaching 2-3

- $a, 2$
- $k, k, -3k$
- $2a + 4$
- $7 - 6x$
- $2n - 5$
- $-3a - 6$
- $3y + 5$
- $11 - 4t$
- $13c - 15$
- $6s + 8$
- 6
- $-9k - 12$