LESSON 2.1

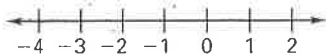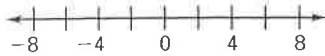## Practice B
For use with pages 64–70

Graph the numbers on a number line. Then order the numbers from least to greatest.

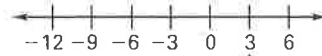**1.** 2, -3, and 0

$$-4\ -3\ -2\ -1\ \ 0\ \ 1\ \ 2$$

2. -5, 7, and -8

$$-8\ \ \ -4\ \ \ 0\ \ \ 4\ \ \ 8$$

3. -9, -12, and 6

$$-12\ -9\ -6\ -3\ \ 0\ \ 3\ \ 6$$

Tell whether each number in the list is a whole number, an integer, or a rational number. Then order the numbers from least to greatest.

4. $-1.9, \frac{3}{4}, 0.8, -3$

5. $1.3, -2, \frac{1}{2}, 0$

6. $2.5, -\frac{7}{8}, -0.5, \frac{1}{3}$

For the given value of a, find $-a$ and $|a|$.

7. $a = 10.2$

8. $a = -14$

9. $a = \frac{1}{2}$

Identify the hypothesis and conclusion of the conditional statement. Tell whether the statement is *true* or *false*. If it is false, give a counterexample.

10. If a number is negative, then its opposite is positive.

11. If a number is even, then its opposite is a whole number.

Evaluate the expression when $x = -2.5$.

12. $-x$

13. $|x| + 3$

14. $|x| - 4$

15. **Fairbanks, Alaska** The table shows the monthly normal temperatures in Fairbanks, Alaska, during the winter months. Which monthly temperature is the lowest? Which months had temperatures below $-5°$F?

Month	December	January	February	March
Temperature (°F)	$-7°$	$-10°$	$-4°$	$11°$

16. **Stock Market** The gains and losses of a stock for a week are shown in the table. Which day showed the greatest gain? Which day showed the greatest loss?

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Gain or loss	$+0.02$	-0.05	-0.12	-0.08	-0.01

17. **Class Enrollment** The table shows the growth in enrollment of the senior class at a high school between 1999 and 2004. Which year showed the greatest increase in class size? Which year showed the greatest decrease in class size?

Year	1999	2000	2001	2002	2003	2004
Increase	15	22	-7	-12	10	18

Name _____   Date _____

Practice B
For use with pages 73-79

Use a number line to find the sum.

1. $-8 + 9$

2. $13 + (-4)$

3. $-5 + (-11)$

4. $-6 + (-7)$

5. $-15 + 6$

6. $-21 + 10$

Find the sum.

7. $-4.2 + 6.5$

8. $14.2 + (-9.1)$

9. $7.8 + (-3.9)$

10. $2\frac{2}{3} + \left(-1\frac{1}{3}\right)$

11. $-7\frac{1}{2} + 10\frac{3}{4}$

12. $8\frac{2}{3} + \left(-9\frac{1}{6}\right)$

13. $-10 + (-23) + 18$
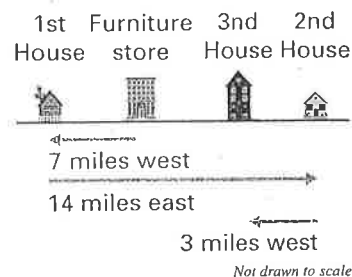
14. $-1.25 + 2.5 + 3.5$

15. $-2.6 + 7.5 + 5.6$

Evaluate the expression for the given value of *x*.

16. $6 + x + (-11); x = 8$

17. $-14 + x + 14; x = 9$

18. $2.2 + x + (-3.4); x = -2.5$

19. $-4.3 + (-x) + 1.5; x = 3.1$

20. $-2.8 + (-x) + 8.1; x = -3.6$

21. $-6.8 + |x| + 2.6; x = -3.2$

Solve the equation.

22. $x + 15 + (-15) = 6$

23. $6 + x + (-3) = 0$

24. $x + (-2.5) + 6.8 = 0$

25. **Delivery Driver** A furniture delivery driver is given three deliveries for the morning. The first delivery is 7 miles west of the furniture store. The second delivery is 14 miles east of the first house, and the last delivery before lunch is 3 miles west of the second house. How far is the delivery driver from the store after the last delivery?

1st   Furniture   3nd   2nd
House   store   House House

7 miles west

14 miles east

3 miles west

Not drawn to scale

26. **Homework** Your history teacher gives you an extra credit question on each homework assignment. You've been keeping track of how many points you are above or below the number of regular points you can earn on each assignment. How many total points do you have if there are 125 regular homework points for the five assignments?

Assignment	1	2	3	4	5
Number of points above and below	-2	4	-1	5	-3

27. **Company Profits** The table shows the profits earned by a small company during the first six months of the year. Did the company make a positive profit for the first six months? If so, how much?

Month	January	February	March	April	May	June
Profit	$1500	-$2000	$1000	$3000	-$2000	-$1000

Practice A
LESSON 2.3
For use with pages 80–85

Write the opposite of the number.

1. -5
2. 6.25
3. $-\dfrac{1}{2}$

Find the difference.

4. $15 - (-3)$
5. $18 - (-21)$
6. $-5 - (-6)$

7. $-11 - (-19)$
8. $-24 - (-35)$
9. $24 - (-8)$

10. $-9 - (-12)$
11. $-15 - (-36)$
12. $-10 - (-55)$

13. $17.5 - (-5)$
14. $14.2 - (-3.6)$
15. $-7.2 - (-5.1)$

Evaluate the expression when $x = 2.5$ and $y = -4$.

16. $y - x$
17. $x - y$
18. $y - x + 3$

19. $y - 8 - x$
20. $x - 4 - y$
21. $-y + 12 + x$

22. $x + y - 6$
23. $10.5 - x - y$
24. $x + 3.5 - y$

25. $4.5 - x - y$
26. $6.5 - x + y$
27. $y + 4 - (-x)$

Find the change in temperature or elevation.

28. From $-8°C$ to $-20°C$
29. From $-10°F$ to $32°F$

30. From $10°F$ to $-7°F$
31. From -400 feet to -200 feet

32. From 600 meters to -50 meters
33. From -5 yards to 4 yards

34. **Elevations** The highest point in Long Beach, California is at 360 feet. The lowest point in Long Beach is at -7 feet. What is the difference in the elevations?

35. **Moon** The average daytime temperature on the surface of the moon is $107°C$ and the average nighttime temperature on the surface of the moon is $-153°C$. What is the change in temperature from nighttime to daytime?

36. **Scuba Diving** You are scuba diving at a depth of 50 feet below sea level. Thirty minutes later, you are at a depth of 42 feet below sea level. What is your change in depth? Did you go up or down?

37. **Gasoline Prices** The table shows the average weekly prices (in dollars) of a gallon of regular gasoline during a month at a gas station. Determine the change in the price per gallon each week. Find the total of these changes to determine the total change in the price per gallon over the 4 weeks.

Week	1	2	3	4
Price per gallon (dollars)	2.10	2.15	2.09	2.11

LESSON 2.3

Name _____ Date _____

Practice B
For use with pages 87–93

Find the product.

1. $10(-9)$

2. $-12(-3)$

3. $-11(7)$

4. $2.6(-8)$

5. $-3.2(15)$

6. $-9.5(5)$

7. $-\frac{1}{2}(28)$

8. $-\frac{2}{3}(-21)$

9. $\frac{4}{5}(-20)$

10. $-6(4)(-3.5)$

11. $-2.1(-10)(-5)$

12. $-6.5(21)(-6)$

Identify the property illustrated.

13. $5.6 \cdot (-3.2) = -3.2 \cdot 5.6$

14. $0 \cdot 2.1 = 0$

15. $-1 \cdot (-1.5) = 1.5$

Find the product. Justify your steps.

16. $-3(-5)(-4x)$

17. $-\frac{3}{4}(-20)(7y)$

18. $8x(4.2)(-5)$

Evaluate the expression when $x = -3$ and $y = 4.1$.

19. $x + 2y$

20. $y - 4x$

21. $5.2x - y$

22. $xy - 10.1$

23. $14.3 - xy$

24. $3x - |y|$

25. **Death Valley** The lowest point in North America is Death Valley, California. Its elevation is at -86 meters. What is this elevation in feet? *Hint:* Use the fact that 1 meter ≈ 3.281 feet.

26. **Lava Flow** A kind of lava, block lava, is moving away from the base of a volcano at a rate of 1.5 meters per day. If the lava continues to flow at this rate, how far away has the lava flowed from the base of the volcano in 30 days?

27. **Snow Melt** After a recent snowfall, the snow on the ground in a shaded area is melting at a rate of 0.01 inch per minute. Currently, there are 4 inches of snow on the ground. If the snow continues melting at this rate, how much snow will be on the ground in 6 hours? How much snow has melted?

28. **City Population** In 1990, the population of the Pittsburgh, Pennsylvania area was 1679 thousand people. The table shows the average rate of change in the population for two periods of time. Find the total population in 2000 and 2002.

Time period	Rate of change (thousand people/yr)
1990–2000	-3.7
2000–2002	-6.5

LESSON 2.5 Practice A
For use with pages 96–101

Decide whether the statement is *true* or *false*. If it is false, rewrite the right-hand side of the equation so that the statement is true.

1. $9(1 + 4) \overset{?}{=} 9(1) + 4$

2. $(10 + 3)6 \overset{?}{=} 10(6) + 10(3)$

3. $15(8 - 3) \overset{?}{=} 15(8) - 15(3)$

4. $(18 - 5)(2) \overset{?}{=} 18 - 5(2)$

Use the distributive property to write an equivalent expression.

5. $3(x + 5)$

6. $(x + 2)6$

7. $-2(x + 9)$

8. $(x + 10)(-1)$

9. $4(x - 6)$

10. $-3(x - 1)$

Identify the terms, like terms, coefficients, and constant terms of the expression.

11. $2x + 5 + x + 1$

12. $18 + 2y - 1 + 3y$

13. $8x + 4 - 3x + 7$

14. $21 - 8x - 4 + 9x$

15. $2x^2 - 3 + 5x^2 + 10$

16. $-3x^2 + 1 + 8x^2 - 5$

Simplify the expression.

17. $8x + (-12x)$
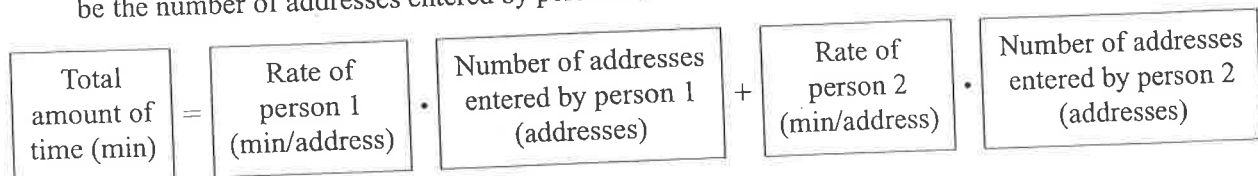
18. $17x + (-9x)$

19. $15x - x$

20. $3 + 6x + 1$

21. $8x + 5 + 2x$

22. $2(x + 4) + 7x$

23. Necklaces You are making necklaces using two different colors of stone beads. Stone A costs \$.07 per bead and stone B costs \$.05 per bead. You need 50 beads to complete a necklace. The equation $c = 0.07n + 0.05(50 - n)$ gives the total cost c as a function of the number n of stone A beads used. Find the total cost if you use 35 stone A beads.

24. Hiking Socks A local sports store is selling its hiking socks for \$2 off the regular price of a pair of socks. You buy 3 pairs of hiking socks. Write an equation that gives the total cost t as a function of the regular cost r of a pair of socks. Then find the total cost if the socks regularly cost \$10 per pair.

25. Catalog Mailing List Two data entry personnel enter addresses for a catalog's mailing list. Person 1 can enter 4 addresses in one minute. Person 2 can enter 2 addresses in one minute. Use the verbal model below to write an equation that you can use to find out how long it will take the personnel to enter 500 addresses. Let a be the number of addresses entered by person 1.

Total amount of time (min)	=	Rate of person 1 (min/address)	·	Number of addresses entered by person 1 (addresses)	+	Rate of person 2 (min/address)	·	Number of addresses entered by person 2 (addresses)

LESSON 2.6 Practice B
For use with pages 103–108

Find the multiplicative inverse of the number.

1. -7

2. $-\frac{1}{5}$

3. $-\frac{7}{8}$

Find the quotient.

4. $-32 \div (-2)$

5. $-1 \div \left(-\frac{6}{5}\right)$

6. $14 \div \left(-\frac{2}{7}\right)$

7. $17 \div \left(-2\frac{1}{8}\right)$

8. $-\frac{3}{4} \div 4$

9. $-\frac{1}{3} \div \frac{1}{5}$

10. $-\frac{1}{9} \div (-8)$

11. $-\frac{6}{11} \div (-3)$

12. $\frac{5}{8} \div \left(-2\frac{1}{2}\right)$

Find the mean of the numbers.

13. $1, -3, -10$

14. $-15, 4, -22$

15. $-7.5, 3, -6.5$

Simplify the expression.

16. $\frac{-8x + 27}{9}$

17. $\frac{15x - 5}{-5}$

18. $\frac{12x - 20}{-4}$

19. **Melting Point** The melting point of the element fluorine is $-219.62°C$. The melting point of the element bromine is $-7.2°C$. How many times lower is the melting point of fluorine than the melting point of bromine? Round your answer to the nearest tenth.

20. **Website Traffic** During a 3-month period, the traffic to a website dropped by 126,000 visitors. Find the average rate of change in the traffic to the website (in visitors per month) over the 3-month period.

21. **Average Velocity** The velocity of an object indicates the object's speed and the direction in which the object is traveling. A negative velocity indicates that the object is moving downward or backward. A hawk is diving downward at a rate of 50 feet in 28 seconds. Find the hawk's average velocity (in feet per second). Round your answer to the nearest tenth.

22. **Health Club** The table below shows change in the number of memberships at a health club. What is the average change in the number of memberships (in members per month)?

Month	Nov.	Dec.	Jan.	Feb.	Mar.
Change in number of memberships	18	10	40	−25	−15

23. **Bank Account Activity** During a 14-day period, there is the following activity on your bank account. You deposit $100, withdraw $75, deposit $85, and withdraw $150. What is the rate of change (in dollars per day) in your bank account? Round your answer to the nearest cent.

LESSON 2.6

Name _____ Date _____

Write the number as a power.

1. 36

2. 100

3. 9

Evaluate the expression.

4. $\sqrt{49}$

5. $-\sqrt{4}$

6. $-\sqrt{25}$

7. $\sqrt{81}$

8. $-\sqrt{121}$

9. $\pm\sqrt{16}$

Write the greatest perfect square less than the number and the least perfect square greater than the number.

10. 13

11. 28

12. 45

Approximate the square root to the nearest integer.

13. $\sqrt{5}$

14. $\sqrt{19}$

15. $-\sqrt{28}$

16. $-\sqrt{53}$

17. $-\sqrt{11}$

18. $\sqrt{70}$

Tell whether each number in the list is a real number, a rational number, an irrational number, an integer, or a whole number. Then order the numbers from least to greatest.

19. $\sqrt{64}, -5, \sqrt{9}, 2$

20. $\sqrt{3}, 5.5, -\sqrt{16}, 0$

**21.** $\frac{2}{3}, \sqrt{4}, -3.6, -\sqrt{1}$

22. $-\sqrt{6}, \frac{5}{2}, 7, -4$

23. **Area Rug** You are considering buying a square area rug that has an area of 25 square feet. Find the side length of the area rug.

24. **Road Sign** The U.S. Department of Transportation determines the sizes of the traffic control signs that you see along the roadways. The square Alabama state route sign at the right has an area of 576 square inches. Find the side length of the sign.

21

25. **Sailboat** You can determine the top speed (in knots) of a sailboat using the expression $1.34\sqrt{\ell}$, where ℓ is the boat's length (in feet) where it meets the water. Find the top speed of a sailboat with a length of 10 feet at the water. Round your answer to the nearest tenth.
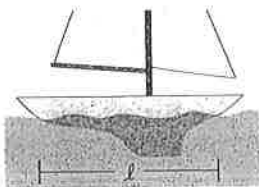
CHAPTER 2 Cumulative Review
For use after Chapter 2

Evaluate the expression when $x = 3$ and $y = -5$. *(Lessons 1.1, 2.3)*

1. $7x - 2$ **2.** $y - x$ **3.** $2x - y$ **4.** $x^2 - (3 + y)$

Evaluate the expression. *(Lesson 1.2)*

5. $8 - 9 \div 3 + 2^2$ **6.** $\dfrac{17 - 13}{3^2 - 1}$ **7.** $42 - [(5^2 + 3^3) \div 4]$

Write an algebraic expression, equation, or inequality. *(Lesson 1.3, 1.4)*

8. The difference of three times a number x and 4

9. 11 less than the product of 8 and a number y

10. The sum of a number x and 15 is 7.

11. 7 times a number y is less than the number y squared.

Check whether 3 is a solution of the equation or inequality. *(Lesson 1.5)*

12. $12 + 4x = 19$ **13.** $x^2 - 7 \le 12$ **14.** $12x - 5 > 3x^2 + 5$

15. **Boarding Fees** A dog kennel's boarding fees are $11.50 per night for a small dog and $13.75 per night for a large dog. First write an algebraic expression for the total income from boarding fees. Then find the total income if 7 small dogs and 5 large dogs were boarded for the night.

Write a rule for the function. Identify the domain and the range.
(Lesson 1.6)

16.

Input, x	5	6	7	8	9
Output, y	1	2	3	4	5

17.

Input, x	0	2	4	6	8
Output, y	0	1	2	3	4

18. Graph the function $y = 3x + 1$ with domain 0, 1, 2, 3, and 4. *(Lesson 1.7)*

Order the numbers in the list from least to greatest. *(Lesson 2.1, 2.7)*

19. $-\dfrac{1}{3}, 0, 1.5, -0.6, \dfrac{1}{2}$ **20.** $3.2, -\sqrt{8}, -3.5, \sqrt{9}, -\sqrt{4}$

CHAPTER 2 | **Cumulative Review** *continued*
For use after Chapter 2

For the given value of *x*, find −*x* and |*x*|. *(Lesson 2.1)*

21. $x = -21$

22. $x = -0.75$

23. $x = \dfrac{2}{7}$

Find the sum, difference, product, or quotient. *(Lessons 2.2, 2.3, 2.4, 2.6)*

24. $-8 + (-7)$

25. $1.3 + (-2.7)$

26. $11 - 15$

27. $-3.8 - 7.3$

28. $0.4 - (-0.8)$

29. $-\dfrac{7}{16} - \left(-\dfrac{3}{8}\right)$

30. $-6(11)$

31. $12\left(-\dfrac{1}{2}\right)$

32. $(-35)\left(-\dfrac{1}{5}\right)$

33. $-42 \div (-7)$

34. $-18 \div \dfrac{2}{3}$

35. $\dfrac{9}{28} \div \left(-\dfrac{3}{4}\right)$

Identify the property being illustrated. *(Lesson 2.2, 2.4)*

36. $5.7 + (-5.7) = 0$

37. $[7 + (-9)] + (-3) = 7 + [(-9) + (-3)]$

38. $-7 \cdot 1 = -7$

39. $-8 \cdot 9 = 9 \cdot (-8)$

Simplify the expression. *(Lesson 2.5, 2.6)*

40. $-6(x + 9)$

41. $(y - 11)(-3y)$

42. $\dfrac{9(z - 6)}{2}$

43. $8x + 3(5x - 4)$

44. $\dfrac{1}{4}(12y - 2) + 9y$

45. $\dfrac{-21z + 7}{7}$

Find the mean of the numbers. *(Lesson 2.6)*

46. $15, -7, -11$

47. $12, -8, 9, -5$

Rewrite the conditional statement in if-then form. Then tell whether the statement is *true* or *false*. If the statement is false, give a counterexample. *(Lesson 2.7)*

48. All irrational numbers are real numbers.

49. All integers are whole numbers.

Evaluate the expression. *(Lesson 2.7)*

50. $-\sqrt{144}$

51. $\pm\sqrt{36}$

52. $\sqrt{16}$

53. $-\sqrt{361}$

REVIEW AND PROJECT