

7th Grade Intensive Math Instructional Focus Calendar

2013-2014



First Nine Weeks

7th Grade Intensive Math Instructional Focus Calendar

August 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday																																																																																					
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4	5	6	7	8	9	10																																																																																					
11	12	13	14	15	16	17																																																																																					
18	19 First Day of School	20 2-1 <i>Practice A</i> <i>Reading Strategies</i>	21 2-1 <i>Review for Mastery</i> <i>Success for Every</i> <i>Learner</i>	22 2-1 <i>Course 2 Holt</i> <i>McDougal</i> <i>Hardbound:</i> <i>2-1 Exercises</i>	23 2-2 <i>Practice A</i> <i>Reading Strategies</i>	24																																																																																					
		MA.7.A.3.1			MA.7.A.3.1/ MA.7.A.3.2																																																																																						
25	26 2-2 <i>Review for Mastery</i> <i>Success for Every</i> <i>Learner</i>	27 2-2 <i>Course 2 Holt</i> <i>McDougal</i> <i>Hardbound:</i> <i>2-2 Exercises</i>	28 2-3 <i>Practice A</i> <i>Reading Strategies</i>	29 2-3 <i>Review for Mastery</i> <i>Success for Every</i> <i>Learner</i>	30 2-3 <i>Course 2 Holt</i> <i>McDougal</i> <i>Hardbound:</i> <i>2-3 Exercises</i>	31																																																																																					
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7th Grade Intensive Math Instructional Focus Calendar

Topic I – OPERATIONS with RATIONAL NUMBERS

Benchmarks:

MA.7.A.3.1

MA.7.A.3.2

MA.7.A.5.1

Textbook Chapters: 2-1, 2-2, 2-3, 2-4, 2-11

PART A

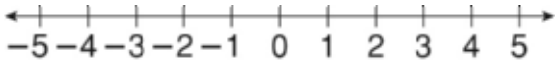
LESSON
2-1

Practice A

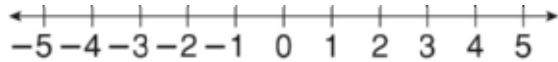
Integers

Graph each integer and its opposite on a number line.

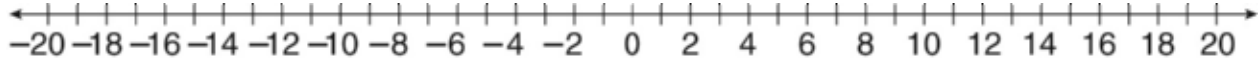
1. 3



2. -5



Use the number line to compare the integers. Write $<$ or $>$.



3. $-8 \underline{\hspace{1cm}}$ 7

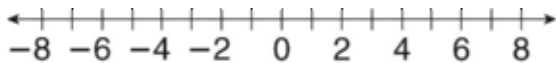
4. $4 \underline{\hspace{1cm}}$ -7

5. $-6 \underline{\hspace{1cm}}$ -16

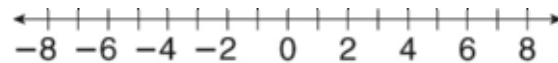
6. $-11 \underline{\hspace{1cm}}$ 11

Graph the integers on a number line. Then write them in order from least to greatest.

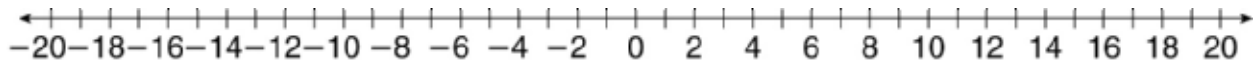
7. -6 ; 3; -5 ; 8



8. 6; -7 ; -8 ; 0



Use a number line to find each absolute value.



9. $|-6|$ _____

10. $|2|$ _____

11. $|-1|$ _____

12. $|8|$ _____

13. $|-9|$ _____

14. $|3|$ _____

15. $|-4|$ _____

16. $|10|$ _____

17. $|-15|$ _____

18. $|20|$ _____

19. $|-13|$ _____

20. $|17|$ _____

21. The windchill on a cold day made it feel like 5 degrees below zero outside. Write this temperature as an integer.

22. A baby gained 15 pounds from birth to his first birthday. Write this amount as an integer.

15. 3.019×10^7 16. 7.355×10^5
 17. 4 18. 830,000
 19. 1.12 20. 4.1
 21. 77,000,000 22. 6
 23. 1.4325×10^5 24. 403,000,000
 25. Brazil 26. 3.7×10^7

Review for Mastery

1. 3; 84,000 2. 5; 6,100,000
 3. 22,000,000 4. 753,000
 5. 82,500 6. 1,230
 7. 3; 8. 6;
 5; $1;^3$ 1; $84;^6$
 9. 6.41×10^5 10. 4.73×10^4
 11. 8.25×10^6 12. 7.03×10^5

Challenge

1. 6.4×10^4 bytes 2. 4×10^7 bytes
 3. 1×10^9 bytes 4. 2.5×10^{11} bytes
 5. 4×10^9 bytes 6. 2.5×10^2 disks
 7. 6.5×10^8 bytes
 8. 2.08×10^{10} bytes

Problem Solving

1. 1.5×10^8 km
 2. 4,500,000,000 km
 3. \$7,600,000,000,000; 7.6×10^{12}
 4. Canada 5. C
 6. I 7. A
 8. H

Reading Strategies

1. 5 times
 2. $2.8 \times 10 \times 10 \times 10 \times 10 \times 10$
 3. 5 places; 4 4. 280,000

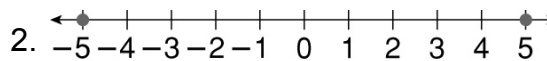
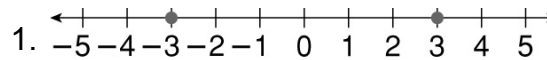
Puzzles, Twisters & Teasers

1. 4 2. 5
 3. 5.92 4. 1.68
 5. 8 6. 2.44; 7

SPACE CHIPS

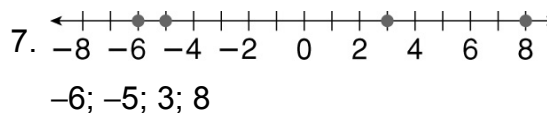
LESSON 2-1

Practice A

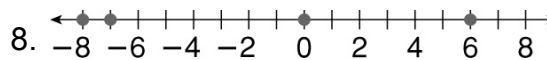


3. < 4. >

5. > 6. <



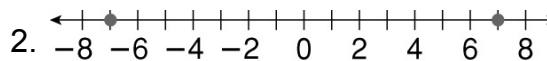
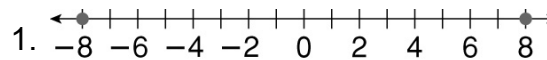
-6; -5; 3; 8



-8; -7; 0; 6

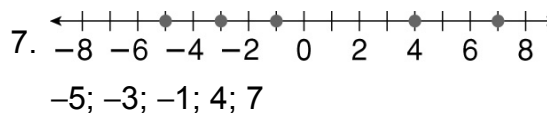
9. 6 10. 2
 11. 1 12. 8
 13. 9 14. 3
 15. 4 16. 10
 17. 15 18. 20
 19. 13 20. 17
 21. -5 22. 15

Practice B

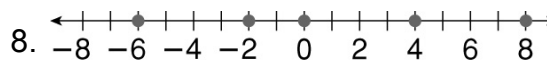


3. < 4. >

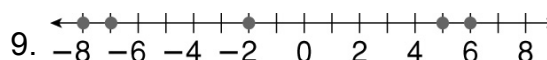
5. < 6. >



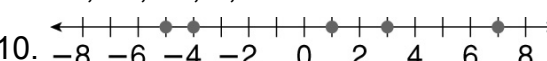
-5; -3; -1; 4; 7



-6; -2; 0; 4; 8



-8; -7; -2; 5; 6



-5; -4; 1; 3; 7

11. 18 12. 11
 13. 25 14. 19

LESSON
2-1

Reading Strategies

Use a Graphic Organizer

<p>Definition</p> <p>The set of whole numbers and their opposites</p>	<p style="text-align: right;">Facts</p> <ul style="list-style-type: none"> • Each number can be paired with its opposite. The opposite of 2 is -2. The opposite of -3 is 3. • Zero is its own opposite.
<p>Integers</p>	
<p>Examples</p> <p>0, 2, 5, 9, 13, -3, -7, -12, -17</p>	<p>Non-examples</p> <p>$\frac{2}{3}$, $\frac{11}{5}$, $2\frac{5}{8}$, 0.5, 0.23, 1.05, 3.61</p>

Answer each question.

1. What are integers?

2. Write the opposite of 6. _____

3. Write the opposite of 10. _____

4. Write the opposite of 0. _____

5. Write the opposite of -8. _____

6. Write the opposite of -3. _____

Write “integer” or “not an integer” for the following numbers.

7. -9 _____

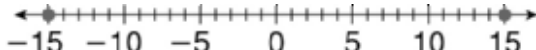

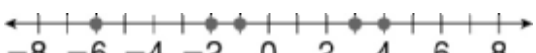

8. $\frac{5}{7}$ _____

9. 0.1 _____

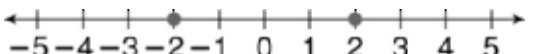
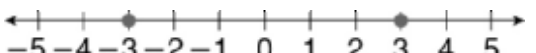
10. 42 _____

15. 10 16. 16
 17. 22 18. 14
 19. 9 20. 24
 21. 7 22. 17
 23. -12 24. 6,684

Practice C

1. 
 2. 
 3. < 4. >
 5. > 6. <
 7. 
 -6; -2; -1; 3; 4
 8. 
 -7; -5; 0; 6; 7
 9. 45 10. 38
 11. 99 12. 22
 13. 19 14. 375
 15. 59 16. 84
 17. = 18. <
 19. < 20. <
 21. > 22. <
 23. > 24. <
 25. 750,000; -2,000,000
 26. -30; 110

Review for Mastery

1. 4 2. 4
 3. opposite integers
 4. 
 5. 
 6. -3; -1; 2 7. -6; -2; 4
 8. -3; 1; 7 9. 3

Challenge

1. $-12 < -11 < 6$
 2. $-201 < -3 < -1$
 3. $-6 < |-3| < |-6|$
 4. $-7 < |3| < |-38|$
 5. $4 > -4 > -40$
 6. $|-18| > 0 > -8$
 7. $|-75| > |12| > 7$
 8. $1 > -12 > -16$

AN ABSOLUTE VALUE

Problem Solving

1. -80
 2. outside Jared's house
 3. -62,500; 34,100
 4. -3°C ; -1°C ; 0°C ; 2°C ; 5°C
 5. C 6. F
 7. A 8. I

Reading Strategies

1. the set of whole numbers and their opposites
 2. -6 3. -10
 4. 0 5. 8
 6. 3 7. integer
 8. not an integer
 9. not an integer
 10. integer

Puzzles; Twisters & Teasers

M	H	T	E	F	V	C	D	E	S	W	I	C	F	R
O	P	P	O	S	I	T	E	V	F	R	N	B	H	U
X	Z	O	I	E	S	W	A	X	N	M	T	A	W	H
N	E	G	A	T	I	V	E	C	P	U	E	I	H	Q
U	R	A	S	D	F	G	H	V	L	R	G	P	O	K
M	O	Z	X	C	V	B	N	A	R	J	E	L	L	Y
B	P	O	I	U	W	H	O	L	E	K	R	S	E	M
E	D	F	G	H	J	K	L	U	W	E	R	T	S	X
R	A	B	S	O	L	U	T	E	Z	A	W	Q	E	C

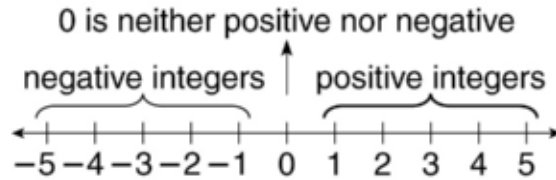
J E L L Y

LESSON
2-1

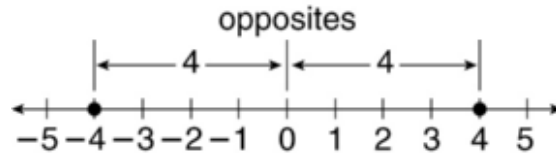
Review for Mastery

Integers

This number line shows integers.



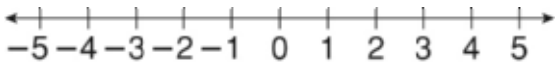
Every integer has an **opposite** integer.
A number and its opposite are the same distance from 0.



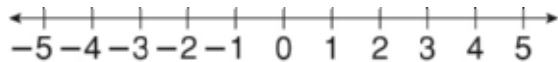
1. How many units is 4 from 0? _____
2. How many units is -4 from 0? _____
3. 4 and -4 are called _____.

Graph each integer and its opposite on a number line.

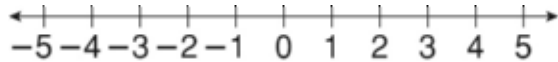
4. 2



5. -3



You can use a number line to compare and order numbers. The numbers get greater as you move to the right on the number line.



6. What is the order from least to greatest of -1, 2, and -3? _____

Write the integers in order from least to greatest.

7. -2; -6; 4

8. -3; 7; 1

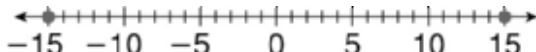

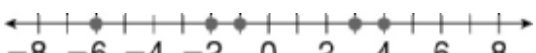

The absolute value of an integer is its distance from 0 on a number line. -5 is 5 units from 0. The absolute value of -5 is 5. You write $|-5| = 5$.



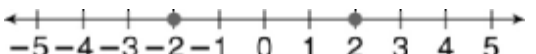
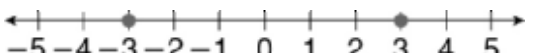
9. How many units from 0 is -3? _____

15. 10 16. 16
 17. 22 18. 14
 19. 9 20. 24
 21. 7 22. 17
 23. -12 24. 6,684

Practice C

1. 
 2. 
 3. < 4. >
 5. > 6. <
 7. 
 -6; -2; -1; 3; 4
 8. 
 -7; -5; 0; 6; 7
 9. 45 10. 38
 11. 99 12. 22
 13. 19 14. 375
 15. 59 16. 84
 17. = 18. <
 19. < 20. <
 21. > 22. <
 23. > 24. <
 25. 750,000; -2,000,000
 26. -30; 110

Review for Mastery

1. 4 2. 4
 3. opposite integers
 4. 
 5. 
 6. -3; -1; 2 7. -6; -2; 4
 8. -3; 1; 7 9. 3

Challenge

1. $-12 < -11 < 6$
 2. $-201 < -3 < -1$
 3. $-6 < |-3| < |-6|$
 4. $-7 < |3| < |-38|$
 5. $4 > -4 > -40$
 6. $|-18| > 0 > -8$
 7. $|-75| > |12| > 7$
 8. $1 > -12 > -16$

AN ABSOLUTE VALUE

Problem Solving

1. -80
 2. outside Jared's house
 3. -62,500; 34,100
 4. -3°C ; -1°C ; 0°C ; 2°C ; 5°C
 5. C 6. F
 7. A 8. I

Reading Strategies

1. the set of whole numbers and their opposites
 2. -6 3. -10
 4. 0 5. 8
 6. 3 7. integer
 8. not an integer
 9. not an integer
 10. integer

Puzzles; Twisters & Teasers

M	H	T	E	F	V	C	D	E	S	W	I	C	F	R
O	P	P	O	S	I	T	E	V	F	R	N	B	H	U
X	Z	O	I	E	S	W	A	X	N	M	T	A	W	H
N	E	G	A	T	I	V	E	C	P	U	E	I	H	Q
U	R	A	S	D	F	G	H	V	L	R	G	P	O	K
M	O	Z	X	C	V	B	N	A	R	J	E	L	L	Y
B	P	O	I	U	W	H	O	L	E	K	R	S	E	M
E	D	F	G	H	J	K	L	U	W	E	R	T	S	X
R	A	B	S	O	L	U	T	E	Z	A	W	Q	E	C

J E L L Y

Integers**Steps for Success**

Step I In order to introduce the concept of integers, direct students to the photo in the lesson opener.

- Explain that if the surface of the water is zero, then a negative number represents the location of someone beneath the water surface, such as a diver. A positive number represents the location of someone above the water surface, such as a lifeguard in a chair.
- Discuss the concept of elevation. Explain that at sea level the elevation is zero. Locations above sea level are represented with positive numbers, and locations below sea level are represented with negative numbers. Ask students if they know the elevation of their city with respect to sea level.

Step II Ask the students to complete the worksheet.

- Problem 1 on the worksheet supports the lesson opener.
- Problem 2 on the worksheet supports Example 1A in the student textbook. Ask students to explain the word *opposite*. Make a list on the board of common opposite words: open/close, up/down, in/out, forward/backward.
- Problem 3 on the worksheet supports Example 4 in the student textbook.

Step III Teach the lesson. Assess students' understanding of the lesson by referring them to the Think and Discuss exercises.

Making Connections

- Ask students to describe real-world examples of how integers are used, such as in temperature, golf scores, and elevation.
- Take a field trip to the school football field, or create a field in your school's green space with yard-line markings. Pair up students. Position one student at the 50-yard line. Have the other student call out a loss or gain of yardage. The student on the field then has to move according to the loss or the gain.
- Verify that students understand that opposites are equidistant from zero by having them count with their fingers the distance from zero to each number.
- Have students create a number line for the classroom. Use the number line to physically show distances from zero to a given integer. This can also be used to explain opposites, ordering integers, and absolute value.
- Have students research the elevation of the five largest cities closest to their hometown.

LESSON

Student Worksheet

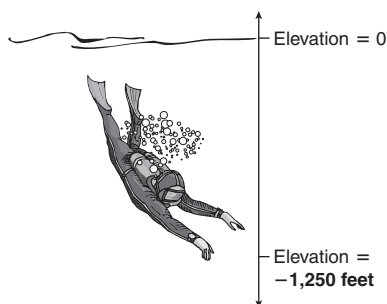
2-1 Integers

Problem 1

An **integer** is a positive or negative whole number.

A positive number is a number greater than zero.

A negative number is a number less than zero.



Sylvia Earle dove to an elevation of $-1,250$ feet.

Problem 3

A number's **absolute value** is its distance from 0 on a number line.

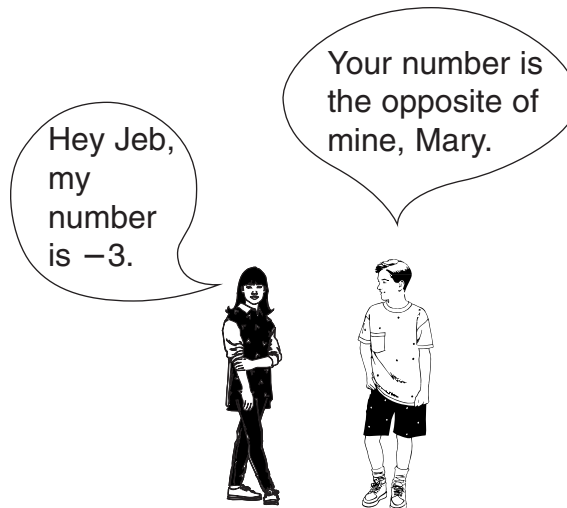
Think and Discuss

1. What is the absolute value of 2?

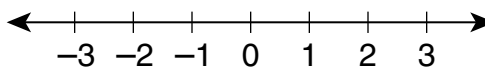
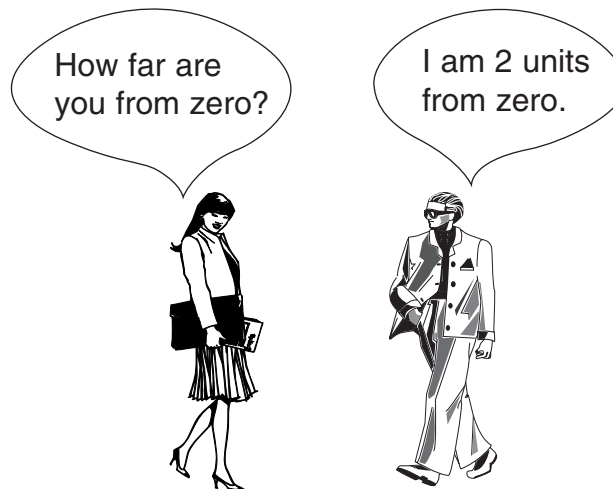
2. What is the absolute value of -2 ?

3. Name two integers that have the same absolute value.

Problem 2



Jeb's number is 3.



Answers

Lesson 2-1

Think and Discuss

- 2
- 2

Lesson 2-2

Think and Discuss

- different signs
- add
- add; -9

Lesson 2-3

Think and Discuss

- When you find the difference between a positive number and a negative number, you add.
- -9
- You are not adding or subtracting -4 , you are subtracting 3 from -4 .
- No, they are opposites.

Lesson 2-4

Think and Discuss

- Because both numbers have the same sign. The quotient of two same signed numbers is positive.
- Yes; The quotient is -2 in both cases.

Lesson 2-5

Think and Discuss

- n
- use subtraction
- The equation is a true statement when $n = -13$.
- when $n = -1$
- when $n = 1$
- when $n = 1$
- when $n = -1$

Lesson 2-6

Think and Discuss

- The variable is not alone on one side.
- There are 12 months in the year.
- The coefficient of m would need to be 365.

Lesson 2-7

Think and Discuss

- 4
- It would be the same.

Lesson 2-8

Think and Discuss

- 1, 2, 3, 4, 6, and 12
- Because 6 is not the greatest factor that 24, 36, and 48 have in common.
- In both methods you are finding common factors, and determining the greatest factor that the numbers have in common.

Lesson 2-9

Think and Discuss

- It is the common multiple of both numbers with the least value.
- Because 2 is a factor common to both numbers.

Lesson 2-10

Think and Discuss

- Cher ate the same amount. $\frac{3}{4}$ is equivalent to $\frac{6}{8}$ and $\frac{9}{12}$.

Lesson 2-11

Think and Discuss

- terminating decimal; the decimal comes to an end.
- tenths
- thousandths = $\frac{36}{1,000}$
- Yes; $0.333 \dots$ is a repeating decimal and 0.3 is a terminating decimal.

Assignment Guide

If you finished **Example 1** assign:
Average 1–4, 16–19, 52–58
Advanced 16–19, 40–42, 52–58

If you finished **Example 2** assign:
Average 1–8, 16–23, 31–38, 52–58
Advanced 16–23, 31–42, 52–58

If you finished **Example 3** assign:
Average 1–11, 16–26, 31–42, 50–58
Advanced 16–26, 31–42, 50–58

If you finished **Example 4** assign:
Average 1–42, 51–58
Advanced 16–58

Homework Quick Check

Quickly check key concepts.
 Exercises: 18, 22, 26, 30, 36, 38

 = **WORKED-OUT SOLUTIONS**
 on p. WS3

 **Interactive Answers and Solutions**

Answers

1–4, 16–19. See p. A1.

Math Background

The mathematical concept of absolute value parallels the notion of magnitude in science. Forces act on bodies with a magnitude, or size, and a direction. The sign of an integer tells its direction, and the absolute value tells its magnitude.

Sunshine State Standards

Benchmark	Exercises
MA.7.A.3.1	1–51
Rev. MA.5.A.6.2	52–54
MA.7.A.3.3	55–58

GUIDED PRACTICE

See **Example 1** Graph each integer and its opposite on a number line.

1. 2 2. -9 3. -1 4. 6

See **Example 2** Compare the integers. Use $<$ or $>$.

5. $5 \square -5 >$ 6. $-9 \square -18 >$ 7. $-21 \square -17 <$ 8. $-12 \square 12 <$

See **Example 3** Use a number line to order the integers from least to greatest.

9. 6, -3, -1, -5, 4 10. 8, -2, 7, 1, -8 11. -6, -4, 3, 0, 1
 -5, -3, -1, 4, 6 -8, -2, 1, 7, 8 -6, -4, 0, 1, 3

See **Example 4** Use a number line to find each absolute value.

12. $|-2|$ 2 13. $|8|$ 8 14. $|-7|$ 7 15. $|-10|$ 10

INDEPENDENT PRACTICE

See **Example 1** Graph each integer and its opposite on a number line.

16. -4 17. 10 18. -12 19. 7

See **Example 2** Compare the integers. Use $<$ or $>$.

20. $-14 \square -7 <$ 21. $9 \square -9 >$ 22. $-12 \square 12 <$ 23. $-31 \square -27 <$

See **Example 3** Use a number line to order the integers from least to greatest.

24. -3, 2, -5, -6, 5 25. -7, -9, -2, 0, -5 26. 3, -6, 9, -1, -2
 -6, -5, -3, 2, 5 -9, -7, -5, -2, 0 -6, -2, -1, 3, 9

See **Example 4** Use a number line to find each absolute value.

27. $|-16|$ 16 28. $|12|$ 12 29. $|-20|$ 20 30. $|15|$ 15

PRACTICE AND PROBLEM SOLVING

Compare. Write $<$, $>$, or $=$.

31. $-25 \square 25 <$ 32. $18 \square -55 >$ 33. $|-21| \square 21 =$ 34. $-9 \square -27 >$

35. $34 \square |34| =$ 36. $64 \square |-75| <$ 37. $|-3| \square |3| =$ 38. $-100 \square -82 <$

39. **Earth Science** The table shows the average temperatures in Vostok, Antarctica from March to October. List the months in order from coldest to warmest. **Aug, Jul, Sep, May, Jun, Apr, Mar, Oct**

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Temperature (°F)	-72	-84	-86	-85	-88	-90	-87	-71

40. What is the opposite of $|32|$? **-32** 41. What is the opposite of $|-29|$? **-29**

42. **-2,000,000; 5,000,000**

42. **Business** A company reported a net loss of \$2,000,000 during its first year. In its second year it reported a profit of \$5,000,000. Write each amount as an integer.

REVIEW FOR MASTERY 2-1

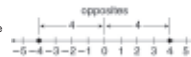
LESSON 2-1 Review for Mastery

Integers

This number line shows integers.

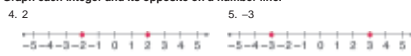


Every integer has an opposite integer. A number and its opposite are the same distance from 0.

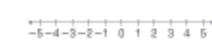


1. How many units is 4 from 0? **4** 2. How many units is -4 from 0? **4**
 3. 4 and -4 are called **opposite integers**.

Graph each integer and its opposite on a number line.



You can use a number line to compare and order numbers. The numbers get greater as you move to the right on the number line.

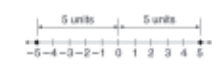


6. What is the order from least to greatest of -1, 2, and -3? **-3; -1; 2**

Write the integers in order from least to greatest.

7. -2; -6; 4 8. -3; 7; 1
-6; -2; 4 **-3; 1; 7**

The absolute value of an integer is its distance from 0 on a number line. -5 is 5 units from 0. The absolute value of -5 is 5. You write $|-5| = 5$.



9. How many units from 0 is -3? **3**

PRACTICE 2-1

LESSON 2-1 Practice B

Integers

Graph each integer and its opposite on a number line.



Compare the integers. Use $<$ or $>$.

3. $-15 < -7$ 4. $8 > -8$ 5. $-14 < 13$ 6. $-18 > -20$

Use a number line to order the integers from least to greatest.



7. -1; 4; -5; 7; -3 8. -6; 8; 0; 4; -2
-5; -3; -1; 4; 7 **-6; -2; 0; 4; 8**



9. 6; 5; -7; -8; -2 10. 1; 3; -4; -5; 7
-8; -7; -2; 5; 6 **-5; -4; 1; 3; 7**

Use a number line to find each absolute value.

11. $|-18|$ 18 12. $|11|$ 11 13. $|-25|$ 25 14. $|19|$ 19

15. $|-9|$ 9 16. $|16|$ 16 17. $|22|$ 22 18. $|-14|$ 14

19. $|9|$ 9 20. $|-24|$ 24 21. $|-7|$ 7 22. $|17|$ 17

23. Christy dove to a depth of 12 feet below the surface of the water. Write the depth as an integer.

-12

24. The highest point in North Carolina is Mt. Mitchell, with a height of 6,684 feet. Write the height of Mt. Mitchell as an integer.

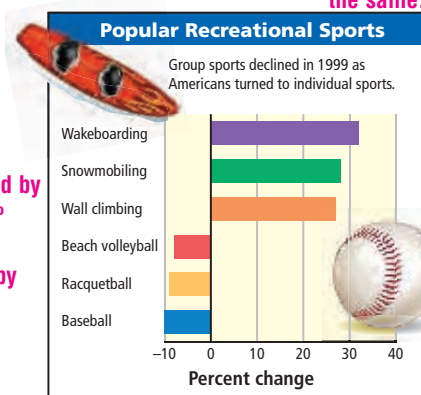
6,684



In wakeboarding, a rider uses the waves created by a boat, the wake, to jump into the air and perform tricks such as rolls and flips.

43. **Critical Thinking** Give an example in which a negative number has a greater absolute value than a positive number. **Possible answer:** $-10 > |9|$
44. **Social Studies** Lines of latitude are imaginary lines that circle the globe in an east-west direction. They measure distances north and south of the equator. The equator represents 0° latitude.
- a. What latitude is opposite of 30° north latitude? **30° south**
- b. How do these latitudes' distances from the equator compare? **They are the same.**

Sports The graph shows how participation in several sports changed between 1999 and 2000 in the United States.



Source: USA Today, July 6, 2001

45. By about what percent did participation in racquetball increase or decrease? **decreased by about 9%**
46. By about what percent did participation in wall climbing increase or decrease? **increased by about 27%**
47. **What's the Error?** At 9 A.M. the outside temperature was -3°F . By noon, the temperature was -12°F . A newscaster said that it was getting warmer outside. Why is this incorrect? **$-12^\circ\text{F} < -3^\circ\text{F}$, so it was getting colder outside.**

48. **Write About It** Explain how to compare two integers.
49. **Challenge** What values can x have if $|x| = 11$? **11 or -11**



Florida Spiral Review

MA.7.A.3.1, MA.7.A.3.3

50. **Multiple Choice** Which list shows the values in order from least to greatest?

- A. $|-5|, |-3|, |-4|, |2|$ C. $|-3|, |2|, |-4|, |-5|$
- B.** $|2|, |-3|, |-4|, |-5|$ D. $|-5|, |-4|, |-3|, |2|$

51. **Multiple Choice** Which number is NOT equivalent to the others?

- F.** -10 G. $|-10|$ H. $|10|$ I. 10

Simplify each expression. Use the order of operations to justify your answer. (Lesson 1-2)

52. $(4 \cdot 9) - (9 - 3)^2$ **0** 53. $5 + 9 \cdot 2^2 \div 6$ **11** 54. $6,842 - (5^3 \cdot 5 \cdot 10)$ **592**

Solve each equation. Check your answer. (Lessons 1-8, 1-9)

55. $n - 22 = 16$ **$n = 38$** 56. $y + 27 = 42$ **$y = 15$** 57. $\frac{m}{36} = 12$ **$m = 432$** 58. $144 = 3p$
 $p = 48$

Ongoing Assessment
and **INTERVENTION**

Diagnose Before the Lesson
2-1 Warm Up, TE p. 64

Monitor During the Lesson
2-1 Learn It, *Worktext* pp. 31-33
2-1 Summarize It, *Worktext* p. 34

Assess After the Lesson
2-1 Lesson Quiz, TE p. 67

Answers

48. Possible answer: Think about their placement on a number line. The integer to the right is the greater integer.



For Exercise 51, encourage students to think about how they would graph each value. Only choice **F** would be graphed as a negative number. Choice **F** is not equivalent to the others.



Journal

Have students describe real-world situations that could be represented using integers. For each situation, ask students what zero would represent. Ask students to discuss what the absolute value of a number would signify in each situation.

CHALLENGE 2-1

Challenge
Order that Integer!

Order each set of integers. Then use the decoder to answer the riddle below.

1. $-12; 6; -11$ 2. $-3; -1; -201$
- $-12 < -11 < 6$** **$-201 < -3 < -1$**
A E V S
3. $|-3|; |-6|; -6$ 4. $|-38|; |3|; -7$
- $-6 < |-3| < |-6|$** **$-7 < |3| < |-38|$**
B L
5. $-4; -40; 4$ 6. $0; -8; |-18|$
- $4 > -4 > -40$** **$|-18| > 0 > -8$**
O A T
7. $|-75|; |12|; 7$ 8. $-16; -12; 1$
- $|-75| > |12| > 7$** **$1 > -12 > -16$**
H U N

What did the car dealer say to the customer?

THIS DEAL IS

- A N** **A B S O L U T E**
 $-4 -12$ $-4 -6 -1 4 -7 1 0 6$
- V A L U E.**
 $-3 -4 -7 1 6$

PROBLEM SOLVING 2-1

Problem Solving
Integers

Write the correct answer.

1. The coldest place on record in the United States was in Alaska in 1971. It was 80°F below zero. Write this temperature as an integer.
 -80
2. The temperature outside was -4°F at Jared's house and -8°F at Mario's house. Where was the temperature warmer?
outside Jared's house
3. A small business reported a net loss of $\$62,500$ during its first year. In its second year, it reported a profit of $\$34,100$. Write each amount as an integer.
 $-62,500; 34,100$
4. For one day, Lacy recorded the low temperatures in five U.S. cities. The temperatures were 5°C , -1°C , -3°C , 2°C , and 0°C . Write the temperatures in order from least to greatest.
 $-3^\circ\text{C}; -1^\circ\text{C}; 0^\circ\text{C}; 2^\circ\text{C}; 5^\circ\text{C}$

Choose the letter for the best answer.

5. Which number is not an integer?
 $-3; 5; \frac{1}{5}; 0$
- A -3 C $\frac{1}{5}$
B 5 D 0
7. Use the table at right. Which continent has the highest point?
- A Asia C Africa
B South America D Australia
8. Use the table at right. Which continent has the lowest point?
F Europe G Australia
H North America I Asia

Continent	Highest Point (ft)	Lowest Point (ft)
North America	20,320	-282
South America	22,834	-131
Africa	19,340	-512
Asia	29,028	-1,339
Australia	7,310	-52
Europe	18,510	-92

Power Presentations with PowerPoint®

2-1 Lesson Quiz

Compare. Use $<$, $>$, or $=$.

1. -32 \square 32 $<$
2. 26 \square $|-26|$ $=$
3. -8 \square -12 $>$

4. Use a number line to order the integers $-2, 3, -4, 5$, and -1 from least to greatest.

$-4, -2, -1, 3, 5$

5. Use a number line to find $|-3|$. **3**

Also available on transparency



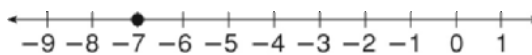
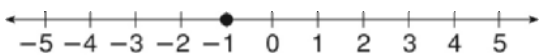
LESSON
2-2

Practice A
Adding Integers

Show the addition on the number line. Then write the sum.

1. $2 + (-3)$

2. $-3 + (-4)$



Find each sum.

3. $-4 + (-9)$

4. $7 + (-8)$

5. $-2 + 1$

6. $6 + (-9)$

7. $5 + 7$

8. $9 + (-5)$

9. $(-1) + 9$

10. $-9 + (-7)$

11. $2 + (-7)$

12. $-6 + (-4)$

13. $3 + 2$

14. $-2 + 6$

Evaluate $e + f$ for the given values.

15. $e = 9, f = -2$

16. $e = -4, f = -6$

17. $e = 6, f = -1$

18. $e = -3, f = 2$

19. $e = 8, f = -6$

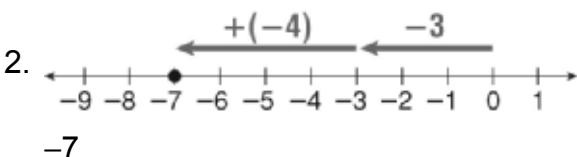
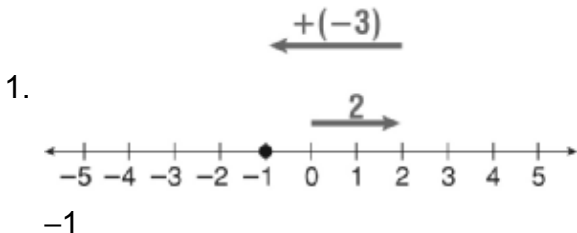
20. $e = -2, f = -3$

21. The temperature dropped 13°F in 7 hours. The final temperature was -2°F . What was the starting temperature?

22. A football team gains 8 yards in one play, then loses 5 yards in the next. How many yards did the team gain in these two plays?

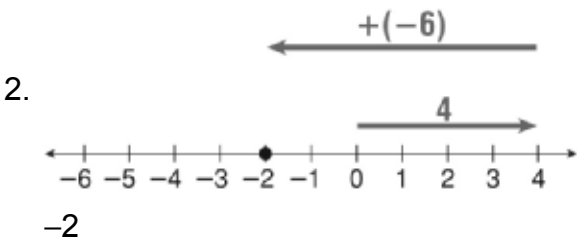
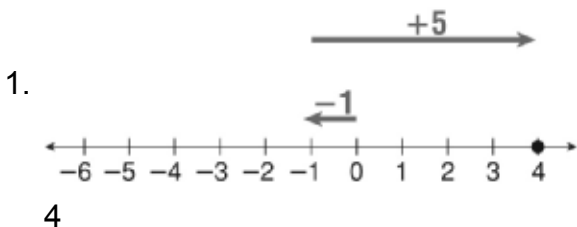
LESSON 2-2

Practice A



- | | |
|-----------|-------------|
| 3. -13 | 4. -1 |
| 5. -1 | 6. -3 |
| 7. 12 | 8. 4 |
| 9. 8 | 10. -16 |
| 11. -5 | 12. -10 |
| 13. 5 | 14. 4 |
| 15. 7 | 16. -10 |
| 17. 5 | 18. -1 |
| 19. 2 | 20. -5 |
| 21. 11 °F | 22. 3 yards |

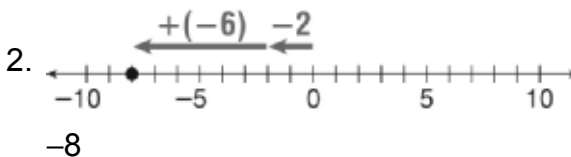
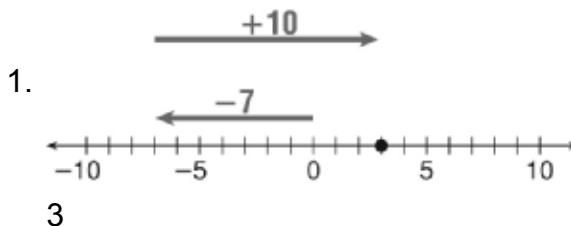
Practice B



- | | |
|--------|---------|
| 3. -60 | 4. 21 |
| 5. -29 | 6. -10 |
| 7. 43 | 8. -34 |
| 9. -14 | 10. -40 |

- | | |
|----------|---------------|
| 11. -6 | 12. 12 |
| 13. -22 | 14. -2 |
| 15. -15 | 16. -24 |
| 17. 13 | 18. -30 |
| 19. 0 | 20. -18 |
| 21. 4 °F | 22. -9 points |

Practice C



- | | |
|-------------------------------------|---------|
| 3. -36 | 4. -23 |
| 5. 29 | 6. 70 |
| 7. 19 | 8. -94 |
| 9. -14 | 10. -96 |
| 11. 6 | 12. -2 |
| 13. -23 | 14. -4 |
| 15. 38 | 16. -80 |
| 17. -29 | 18. = |
| 19. > | 20. < |
| 21. -1 °F | |
| 22. -6 points or a loss of 6 points | |

Review for Mastery

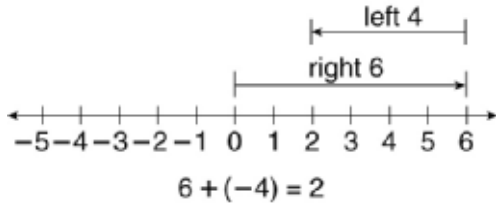
- | | |
|-------------|-------------|
| 1. subtract | 2. negative |
| 3. add | 4. negative |
| 5. -13 | 6. 4 |
| 7. -5 | 8. -1 |
| 9. -4 | 10. 2 |
| 11. -5 | |

LESSON
2-2

Reading Strategies

Use Graphic Aids

Randy's football team had the ball on the zero yard line. On their first play they gained six yards. On the second play they lost four yards. On what yard line is the ball now?



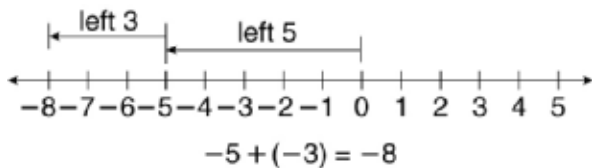
Use the number line to help you answer the questions.

1. On which number do you begin? _____

2. Which direction do you move first? How many places do you move?

3. Which direction do you move next? How many places do you move?

When Angela went to bed, the temperature was zero degrees. When her mother went to bed two hours later, the temperature had gone down 5 degrees. By the time Angela got up the temperature had gone down another 3 degrees. What was the temperature when she got up?



Use the number line to help you answer the questions.

4. On which number do you begin? _____

5. Which direction do you move first? How many spaces?

6. Which direction do you move next? How many spaces?

Challenge

1. -13
2. -22
3. -22
4. -27
5. -2
6. -16
7. -19
8. -5
9. -18
10. >
11. =
12. >
13. >
14. <
15. >
16. <
17. <
18. <
19. Answers will vary.
20. Possible answer: chalk
21. Possible answer: bench
22. Answers will vary.

Problem Solving

1. 5°F
2. -22°F
3. \$35
4. 535 ft
5. -97 ft
6. 17,500 ft
7. B
8. H
9. C
10. I

Reading Strategies

1. 0
2. to the right; 6
3. to the left; 4
4. 0
5. to the left; 5
6. to the left; 3

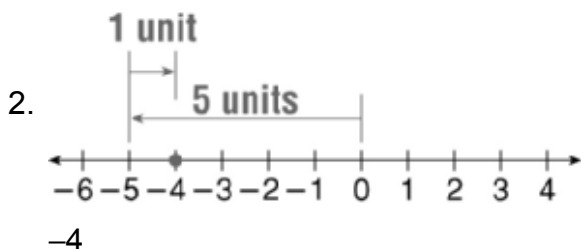
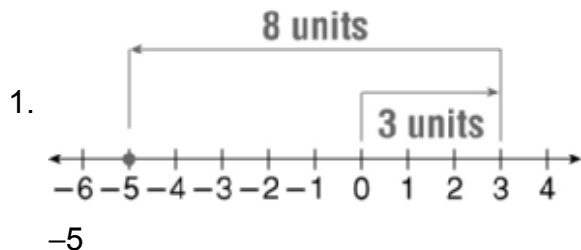
Puzzles, Twisters & Teasers

- R: -9
S: 7
L: -19
H: -88
O: -6
E: -18
C: 39
W: 25
D: 13
A: -17
T: -16
N: 1

S H E W A N T E D
C O L D H A R D C A S H

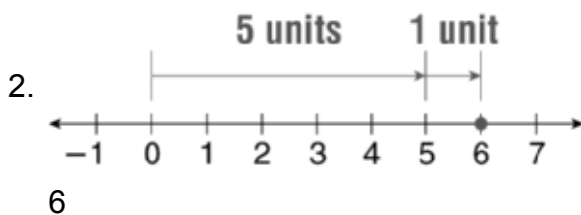
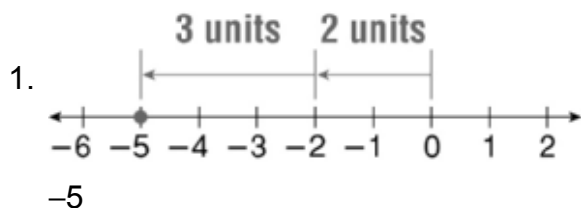
LESSON 2-3

Practice A



3. -7
4. -5
5. 6
6. 9
7. -16
8. 0
9. 1
10. 12
11. 7
12. 16
13. -11
14. 4
15. 9
16. -8
17. 3
18. -2
19. 0
20. -10
21. 9°F
22. 14°F

Practice B



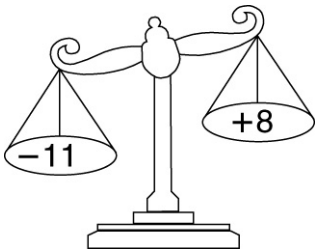
3. -10
4. 5
5. -4
6. 24
7. 0
8. 46

LESSON
2-2

Review for Mastery

Adding Integers

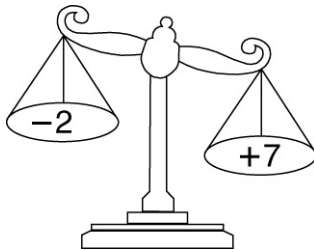
This balance scale “weighs” positive and negative numbers. Negative numbers go on the left of the balance, and positive numbers go on the right.



Find $-11 + 8$.

The scale will tip to the left side because the sum of -11 and $+8$ is negative.

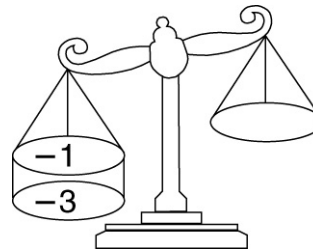
$-11 + 8 = -3$



Find $-2 + 7$.

The scale will tip to the right side because the sum of -2 and $+7$ is positive.

$-2 + 7 = 5$



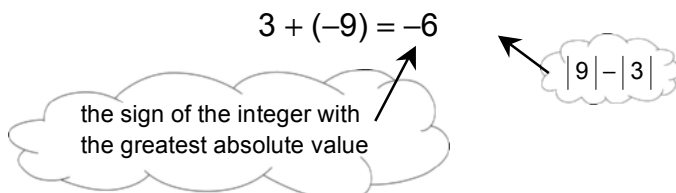
Find $-1 + (-3)$.

Both -1 and -3 go on the left side. The scale will tip to the left side because the sum of -1 and -3 is negative.

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

Find $3 + (-9)$.

- Should you add or subtract? _____
- Will the sum be positive or negative? _____



Find $-5 + (-8)$.

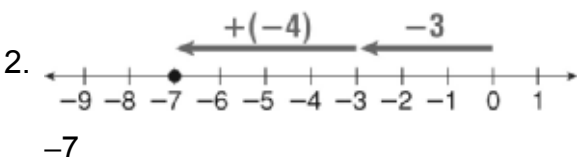
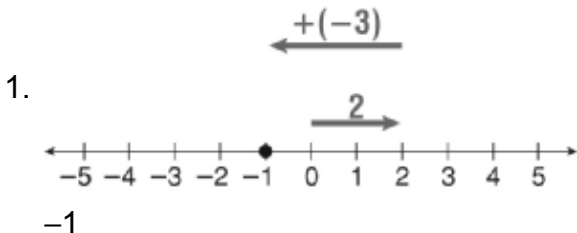
- Should you add or subtract? _____
- Will the sum be positive or negative? _____
- $-5 + (-8) =$ _____

Add.

- | | | |
|------------------------|------------------------|------------------------|
| 6. $7 + (-3) =$ _____ | 7. $-2 + (-3) =$ _____ | 8. $-5 + 4 =$ _____ |
| 9. $-3 + (-1) =$ _____ | 10. $-7 + 9 =$ _____ | 11. $4 + (-9) =$ _____ |

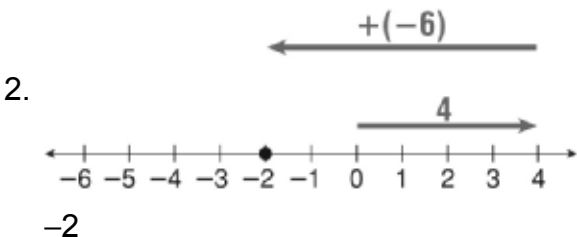
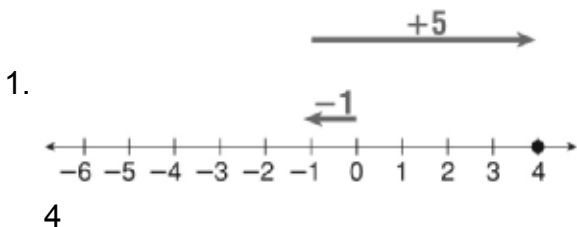
LESSON 2-2

Practice A



- | | |
|-----------|-------------|
| 3. -13 | 4. -1 |
| 5. -1 | 6. -3 |
| 7. 12 | 8. 4 |
| 9. 8 | 10. -16 |
| 11. -5 | 12. -10 |
| 13. 5 | 14. 4 |
| 15. 7 | 16. -10 |
| 17. 5 | 18. -1 |
| 19. 2 | 20. -5 |
| 21. 11 °F | 22. 3 yards |

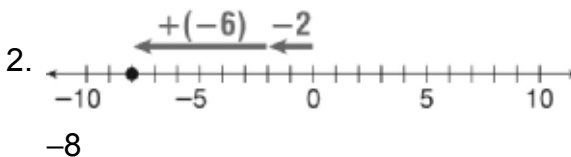
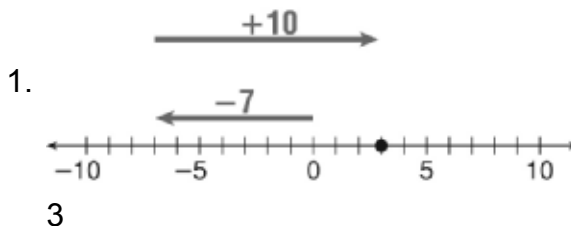
Practice B



- | | |
|--------|---------|
| 3. -60 | 4. 21 |
| 5. -29 | 6. -10 |
| 7. 43 | 8. -34 |
| 9. -14 | 10. -40 |

- | | |
|----------|---------------|
| 11. -6 | 12. 12 |
| 13. -22 | 14. -2 |
| 15. -15 | 16. -24 |
| 17. 13 | 18. -30 |
| 19. 0 | 20. -18 |
| 21. 4 °F | 22. -9 points |

Practice C



- | | |
|-------------------------------------|---------|
| 3. -36 | 4. -23 |
| 5. 29 | 6. 70 |
| 7. 19 | 8. -94 |
| 9. -14 | 10. -96 |
| 11. 6 | 12. -2 |
| 13. -23 | 14. -4 |
| 15. 38 | 16. -80 |
| 17. -29 | 18. = |
| 19. > | 20. < |
| 21. -1 °F | |
| 22. -6 points or a loss of 6 points | |

Review for Mastery

- | | |
|-------------|-------------|
| 1. subtract | 2. negative |
| 3. add | 4. negative |
| 5. -13 | 6. 4 |
| 7. -5 | 8. -1 |
| 9. -4 | 10. 2 |
| 11. -5 | |

Adding Integers**Steps for Success**

Step I In order to create interest for the lesson, refer students to the problem described in the lesson opener and the picture for Problem 1 on the student worksheet.

- Discuss how making and saving money is related to a positive number. Explain that when you put money into a savings account or into a piggy bank that you “add” money to it.
- Discuss how spending and losing money is related to a negative number. Explain that when you take money out of a savings account or out of a piggy bank that you “take away” money from it.

Step II Teach the lesson.

- Walk students through Example 1 in the student textbook. Have students point to the place on the number line where they should begin.
- Review the definitions of sum and difference. Have students brainstorm a list of words that mean “sum” and “difference.”
- Step through the examples and stress the idea that “same signs” means to add and “different signs” means to subtract.

Step III Ask the students to complete the worksheet.

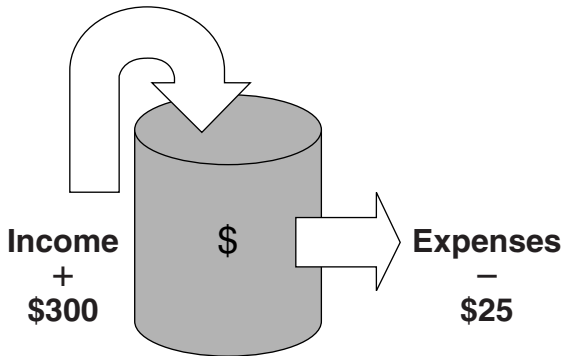
- Refer students to Problem 1 on the worksheet which supports Example 4 in the student textbook.
- Refer students to Problem 2 on the worksheet. This corresponds to Example 1A in the student textbook.
- Remind students to move right on a number line for positive numbers, and to move left for negative numbers.
- Refer students to Problem 3 on the worksheet. This corresponds to Example 2 in the student text.

Making Connections

- Create a list of ten integers on the board, and include 5 negative integers and 5 positive integers. Have students make 2 pairs of integers that have the same sign and 3 pairs of integers that have different signs.
- Use play money to physically demonstrate expenses and income. For instance, give one student \$250. Tell him that he owes one person \$95 and another person \$143. Ask him to calculate how much money he owes. Then have him determine how much money he has left once he pays his debt.

LESSON
2-2 **Student Worksheet**
Adding Integers

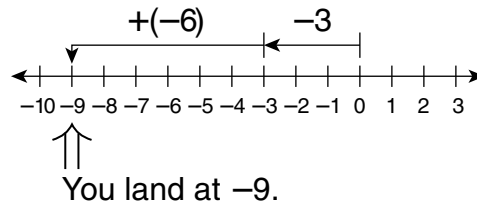
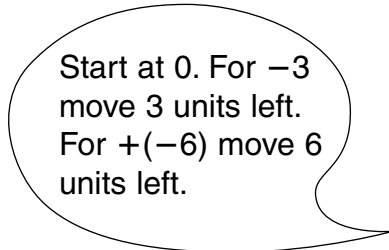
Problem 1



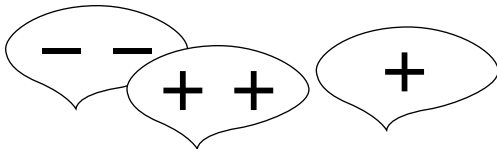
The club has an income of \$300 and expenses of \$25.

Problem 2

What is $-3 + (-6)$?



Problem 3

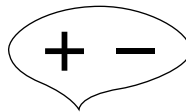


SAME SIGNS → **SUM**

$$7 + 4 = 11$$

or

$$-7 + (-4) = -11$$

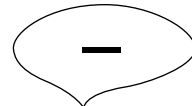


DIFFERENT SIGNS → **DIFFERENCE**

$$8 + (-6) = -2$$

or

$$-8 + 6 = -2$$



Think and Discuss

- Does the expression $-3 + 5$, have same signs or different signs?

- If the signs are the same, do you add or subtract? _____
- In Problem 2, do you add or subtract? What is the answer? _____

Answers

Lesson 2-1

Think and Discuss

- 2
- 2

Lesson 2-2

Think and Discuss

- different signs
- add
- add; -9

Lesson 2-3

Think and Discuss

- When you find the difference between a positive number and a negative number, you add.
- -9
- You are not adding or subtracting -4 , you are subtracting 3 from -4 .
- No, they are opposites.

Lesson 2-4

Think and Discuss

- Because both numbers have the same sign. The quotient of two same signed numbers is positive.
- Yes; The quotient is -2 in both cases.

Lesson 2-5

Think and Discuss

- n
- use subtraction
- The equation is a true statement when $n = -13$.
- when $n = -1$
- when $n = 1$
- when $n = 1$
- when $n = -1$

Lesson 2-6

Think and Discuss

- The variable is not alone on one side.
- There are 12 months in the year.
- The coefficient of m would need to be 365.

Lesson 2-7

Think and Discuss

- 4
- It would be the same.

Lesson 2-8

Think and Discuss

- 1, 2, 3, 4, 6, and 12
- Because 6 is not the greatest factor that 24, 36, and 48 have in common.
- In both methods you are finding common factors, and determining the greatest factor that the numbers have in common.

Lesson 2-9

Think and Discuss

- It is the common multiple of both numbers with the least value.
- Because 2 is a factor common to both numbers.

Lesson 2-10

Think and Discuss

- Cher ate the same amount. $\frac{3}{4}$ is equivalent to $\frac{6}{8}$ and $\frac{9}{12}$.

Lesson 2-11

Think and Discuss

- terminating decimal; the decimal comes to an end.
- tenths
- thousandths = $\frac{36}{1,000}$
- Yes; $0.333 \dots$ is a repeating decimal and 0.3 is a terminating decimal.

2-2 Exercises

Assignment Guide

If you finished **Example 1** assign:
Average 1-4, 13-20, 56, 58-65
Advanced 13-16, 56, 58-65

If you finished **Example 2** assign:
Average 1-8, 13-28, 56-65
Advanced 13-23, 34-41, 56-65

If you finished **Example 3** assign:
Average 1-11, 13-31, 56-65
Advanced 13-31, 34-41, 56-65

If you finished **Example 4** assign:
Average 1-32, 34-44 even, 45-51 odd, 56-65
Advanced 13-57, 58-64 even

Homework Quick Check

Quickly check key concepts.
 Exercises: 14, 16, 26, 28, 30, 32

= **WORKED-OUT SOLUTIONS**
 on p. WS3

Interactive Answers and Solutions

Math Background

The same properties students learned for whole number addition are used for adding integers. The Commutative and Associative Properties allow addition of three or more addends to be rewritten in the most convenient order. Generally, this involves first grouping the positives and then grouping the negatives. Be certain students keep the sign with its number when they change the order. By using integers we can talk about the additive inverse (opposite) of a number. The sum of a number and its inverse is always zero.

Sunshine State Standards

Benchmark	Exercises
MA.7.A.3.1	1-57, 62-65
MA.7.A.3.2	1-57, 62-65
Rev. MA.5.A.6.2	58-61

2-2 Exercises

Homework Help

THINK central

Go to thinkcentral.com
 Exercises 1-32, 33, 37, 39, 43, 47, 49, 51

MA.7.A.3.1
 MA.7.A.3.2

GUIDED PRACTICE

See **Example 1** Use a number line to find each sum.

1. $9 + 3$ **12** 2. $-4 + (-2)$ **-6** 3. $7 + (-9)$ **-2** 4. $-3 + 6$ **3**

See **Example 2** Find each sum.

5. $7 + 8$ **15** 6. $-1 + (-12)$ **-13** 7. $-25 + 10$ **-15** 8. $31 + (-20)$ **11**

See **Example 3** Evaluate $a + b$ for the given values.

9. $a = 5, b = -17$ **-12** 10. $a = 8, b = -8$ **0** 11. $a = -4, b = -16$ **-20**

See **Example 4** **12. Sports** A football team gains 8 yards on one play and then loses 13 yards on the next. Use integer addition to find the team's total yardage. **-5 yards**

INDEPENDENT PRACTICE

See **Example 1** Use a number line to find each sum.

13. $-16 + 7$ **-9** 14. $-5 + (-1)$ **-6** 15. $4 + 9$ **13** 16. $-7 + 8$ **1**
 17. $10 + (-3)$ **7** 18. $-20 + 2$ **-18** 19. $-12 + (-5)$ **-17** 20. $-9 + 6$ **-3**

See **Example 2** Find each sum.

21. $-13 + (-6)$ **-19** 22. $14 + 25$ **39** 23. $-22 + 6$ **-16** 24. $35 + (-50)$ **-15**
 25. $-81 + (-7)$ **-88** 26. $28 + (-3)$ **25** 27. $-70 + 15$ **-55** 28. $-18 + (-62)$ **-80**

See **Example 3** Evaluate $c + d$ for the given values.

29. $c = 6, d = -20$ **-14** 30. $c = -8, d = -21$ **-29** 31. $c = -45, d = 32$ **-13**

See **Example 4** **32.** The temperature dropped 17 °F in 6 hours. The final temperature was -3 °F. Use integer addition to find the starting temperature. **14 °F**

PRACTICE AND PROBLEM SOLVING

Find each sum.

33. $-8 + (-5)$ **-13** 34. $14 + (-7)$ **7** 35. $-41 + 15$ **-26**
 36. $-22 + (-18) + 22$ **-18** **37.** $27 + (-29) + 16$ **14** 38. $-30 + 71 + (-70)$ **-29**

Compare. Write $<$, $>$, or $=$.

39. $-23 + 18$ $>$ -41 40. $59 + (-59)$ $=$ 0 41. $31 + (-20)$ $>$ 9
 42. $-24 + (-24)$ $<$ 48 43. $25 + (-70)$ $>$ -95 44. $16 + (-40)$ $=$ -24

45. Personal Finance Cody made deposits of \$45, \$18, and \$27 into his checking account. He then wrote checks for \$21 and \$93. Write an expression to show the change in Cody's account. Then simplify the expression. **$45 + 18 + 27 + (-21) + (-93)$; -24; Cody's account is reduced by \$24.**

REVIEW FOR MASTERY 2-2

Review for Mastery

2-2 Adding Integers

This balance scale "weighs" positive and negative numbers. Negative numbers go on the left of the balance, and positive numbers go on the right.



Find $-11 + 8$. The scale will tip to the left side because the sum of -11 and $+8$ is negative.
 $-11 + 8 = -3$

Find $-2 + 7$. The scale will tip to the right side because the sum of -2 and $+7$ is positive.
 $-2 + 7 = 5$

Find $-1 + (-3)$. Both -1 and -3 go on the left side. The scale will tip to the left side because the sum of -1 and -3 is negative.
 $-1 + (-3) = -4$

Find $3 + (-9)$.

- Should you add or subtract? **subtract**
- Will the sum be positive or negative? **negative**

$3 + (-9) = -6$ $|3| - |9|$

Find $-5 + (-8)$.

- Should you add or subtract? **add**
- Will the sum be positive or negative? **negative**

$-5 + (-8) = -13$

Add.

6. $7 + -3 = 4$ 7. $-2 + -3 = -5$ 8. $-5 + 4 = -1$

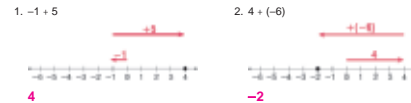
9. $-3 + -1 = -4$ 10. $-7 + 9 = 2$ 11. $4 + -9 = -5$

PRACTICE 2-2

Practice B

2-2 Adding Integers

Use a number line to find each sum.



Find each sum.

3. $-51 + (-9)$ **-60** 4. $27 + (-6)$ **21** 5. $1 + (-30)$ **-29** 6. $15 + (-25)$ **-10**
 7. $50 + (-7)$ **43** 8. $-19 + (-15)$ **-34** 9. $(-23) + 9$ **-14** 10. $-19 + (-21)$ **-40**
 11. $-17 + 11$ **-6** 12. $20 + (-8)$ **12** 13. $(-15) + (-7)$ **-22** 14. $12 + (-14)$ **-2**

Evaluate $e + f$ for the given values.

15. $e = 9, f = -24$ **-15** 16. $e = -17, f = -7$ **-24** 17. $e = 32, f = -19$ **13**
 18. $e = -15, f = -15$ **-30** 19. $e = -20, f = 20$ **0** 20. $e = -30, f = 12$ **-18**

21. The temperature rose 9 °F in 3 hours. If the starting temperature was -5 °F, what was the final temperature?
4 °F

22. Matt is playing a game. He gains 7 points, loses 10 points, gains 2 points, and then loses 8 points. What is his final score?
-9 points



Recreation

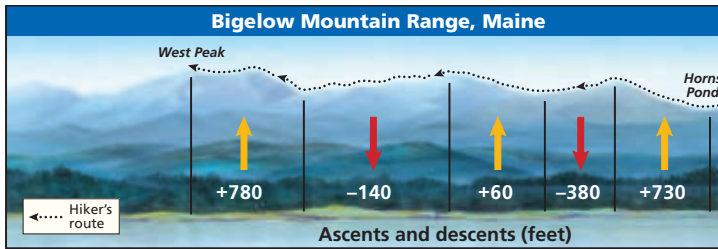


The Appalachian Trail extends about 2,160 miles from Maine to Georgia. It takes about 5 to 7 months to hike the entire trail.

Evaluate each expression for $w = -12$, $x = 10$, and $y = -7$.

46. $7 + y$ **0** 47. $-4 + w$ **-16** 48. $w + y$ **-19** 49. $x + y$ **3** 50. $w + x$ **-2**

51. **Recreation** Hikers along the Appalachian Trail camped overnight at Horns Pond, at an elevation of 3,100 ft. Then they hiked along the ridge of the Bigelow Mountains to West Peak, which is one of Maine's highest peaks. Use the diagram to determine the elevation of West Peak. **4,150 ft**



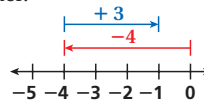
52. **Multi-Step** Hector and Luis are playing a game. In the game, each player starts with 0 points, and the player with the most points at the end wins. Hector gains 5 points, loses 3, loses 2, and then gains 3. Luis loses 5 points, gains 1, gains 5, and then loses 3. Determine the final scores by modeling the problem on a number line. Then tell who wins the game and by how much. **Hector 3, Luis -2; Hector wins by 5 points.**
53. **What's the Question?** The temperature was -8°F at 6 A.M. and rose 15°F by 9 A.M. The answer is 7°F . What is the question? **What was the temperature at 9 A.M.?**
54. **Write About It** Compare the method used to add integers with the same sign and the method used to add integers with different signs.
55. **Challenge** A business had losses of \$225 million, \$75 million, and \$375 million and profits of \$15 million and \$125 million. How much was its overall profit or loss? **loss of \$535 million**

Florida Spiral Review

MA.7.A.3.1

56. **Multiple Choice** Which expression is represented by the model?

- A. $-4 + (-1)$ **C. $-4 + 3$**
 B. $-4 + 0$ D. $-4 + 4$



57. **Multiple Choice** Which expression has the greatest value?

- F. $-4 + 8$** G. $-2 + (-3)$ H. $1 + 2$ I. $4 + (-6)$

Simplify each expression. (Lesson 1-2)

58. $2 + 5 \cdot 2 - 3$ **9** 59. $3^3 - (6 \cdot 4) + 1$ **4** 60. $30 - 5 \cdot (3 + 2)$ **5** 61. $15 - 3 \cdot 2^2 + 1$ **4**

Compare. Write $<$, $>$, or $=$. (Lesson 2-1)

62. -14 \square $|-12|$ **$<$** 63. $|-4|$ \square 3 **$>$** 64. $|-6|$ \square 6 **$=$** 65. $|-9|$ \square -11 **$>$**

CHALLENGE 2-2

Challenge
 Alphabet Addition

Find the value of each word. Each vowel has a value as shown in the table. All consonants have a value of 2.

A	E	I	O	U
-5	-11	-8	-3	-6

- ALGEBRA **-13**
- INTEGER **-22**
- POSITIVE **-22**
- NEGATIVE **-27**
- SIGN **-2**
- ADDITION **-16**
- GREATER **-19**
- LESS **-5**
- EQUAL **-18**

Write $<$, $>$, or $=$ to compare the values of each word pair.

- MANY $>$ FEW
- ALL $=$ NOTHING
- SCHOOL $>$ HOME
- DOG $>$ CAT
- ADD $<$ SUBTRACT
- STOP $>$ GO
- EVALUATE $<$ SOLVE
- MORE $<$ LESS
- EMPTY $<$ FULL

19. Write your name and the first names of 3 other friends or family members. Find the value of each name. Write the names in order from least to greatest value.
Answers will vary.

20. Write a word with a value of 3.
Possible answer: chalk

21. Write a word with a value of -3.
Possible answer: bench

22. What is the highest value word you can think of? Compare it with your classmates' words.
Answers will vary.

PROBLEM SOLVING 2-2

Problem Solving
 Adding Integers

Write the correct answer.

- The temperature dropped 12°F in 8 hours. If the final temperature was -7°F , what was the starting temperature?
 5°F
- At 3 P.M., the temperature was 9°F . By 11 P.M., it had dropped 31°F . What was the temperature at 11 P.M.?
 -22°F
- Tad owes John \$23 and borrows \$12 more. How much does Tad owe John now?
 $\$35$
- New Orleans, Louisiana, is 6 feet below sea level. The highest point in Louisiana, Driskill Mountain, is 541 feet higher than New Orleans. How high is Driskill Mountain?
535 ft
- A submarine submerged at a depth of -40 ft dives 57 ft more. What is the new depth of the submarine?
 -97 ft
- An airplane at 20,000 ft drops 2,500 ft in altitude. What is the new altitude?
17,500 ft

Choose the letter for the best answer.

- Last week, Jane made deposits of \$64, \$25, and \$37 into her checking account. She then wrote checks for \$52 and \$49. What is the overall change in Jane's account balance?
 A $-\$99$ C $\$126$
 B $\$25$ D $\$227$
- In Indianapolis, Indiana, the coldest recorded temperature was -27°F . The hottest recorded temperature was 134°F higher. What was the hottest temperature in Indianapolis?
 F 107°F H 107°F
 G 127°F I -150°F
- The Aral Sea and the Caspian Sea are actually lakes. The elevation of the Caspian Sea is 92 feet below sea level. The Aral Sea is 217 feet higher. What is the elevation of the Aral Sea?
 F -125 ft H 309 ft
 G -309 ft I 125 ft

Ongoing Assessment

and **INTERVENTION**

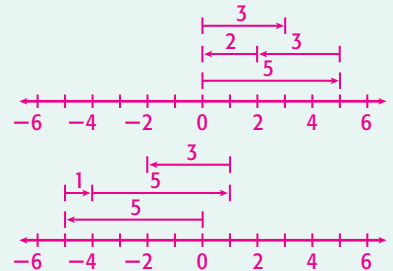
Diagnose Before the Lesson
 2-2 Warm Up, TE p. 68

Monitor During the Lesson
 2-2 Learn It, *Worktext* pp. 39-41
 2-2 Summarize It, *Worktext* p. 42

Assess After the Lesson
 2-2 Lesson Quiz, TE p. 71

Answers

52.



54. **Possible answer:** First add integers with like signs. The sign of the sum is the sign of the integers. Then add unlike integers by finding the difference of their absolute values. Use the sign of the integer with the greater absolute value.



For Exercise 57, students can eliminate choice **G** right away because it involves the sum of two negative numbers.



Journal

Have students describe real-world situations in which integer addition is used (e.g., changes in temperature, altitude, or stock prices). Ask students to explain how to find the sum.

Power Presentations with PowerPoint®

2-2 Lesson Quiz

- Use a number line to find the sum $-7 + (-6)$. **-13**
- Find each sum. **0**
- $-15 + 24 + (-9)$
- $-24 + 7 + (-3)$ **-20**
- Evaluate $x + y$ for $x = -2$ and $y = -15$. **-17**
- The math club's income from a bake sale was \$217. Advertising expenses were \$32. Use integer addition to find the club's total profit or loss. **\$185 profit**

Also available on transparency



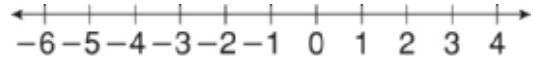
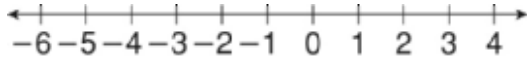
LESSON
2-3

Practice A
Subtracting Integers

Show the subtraction on the number line. Then write the difference.

1. $3 - 8$

2. $-5 - (-1)$



Find each difference.

3. $-3 - 4$

4. $-7 - (-2)$

5. $12 - 6$

6. $2 - (-7)$

7. $-8 - 8$

8. $-5 - (-5)$

9. $-1 - (-2)$

10. $9 - (-3)$

11. $8 - 1$

12. $7 - (-9)$

13. $-3 - 8$

14. $-3 - (-7)$

Evaluate $x - y$ for each set of values.

15. $x = 6, y = -3$

16. $x = -7, y = 1$

17. $x = -2, y = -5$

18. $x = 9, y = 11$

19. $x = -1, y = -1$

20. $x = -5, y = 5$

21. The high temperature one day was 6°F . The low temperature was -3°F . What was the difference between the high and low temperatures for the day?

22. The temperature changed from -7°F at 6 A.M. to 7°F at noon. How much did the temperature increase?

Challenge

1. -13
2. -22
3. -22
4. -27
5. -2
6. -16
7. -19
8. -5
9. -18
10. >
11. =
12. >
13. >
14. <
15. >
16. <
17. <
18. <
19. Answers will vary.
20. Possible answer: chalk
21. Possible answer: bench
22. Answers will vary.

Problem Solving

1. 5°F
2. -22°F
3. \$35
4. 535 ft
5. -97 ft
6. 17,500 ft
7. B
8. H
9. C
10. I

Reading Strategies

1. 0
2. to the right; 6
3. to the left; 4
4. 0
5. to the left; 5
6. to the left; 3

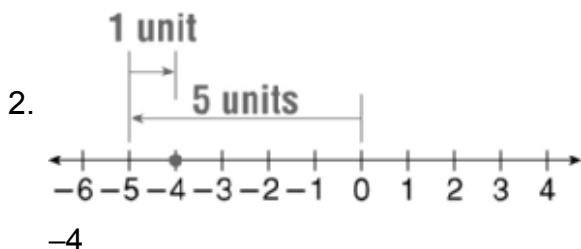
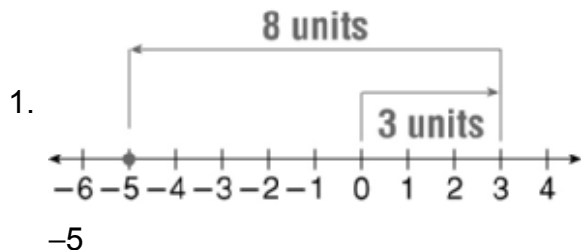
Puzzles, Twisters & Teasers

- R: -9
S: 7
L: -19
H: -88
O: -6
E: -18
C: 39
W: 25
D: 13
A: -17
T: -16
N: 1

S H E W A N T E D
C O L D H A R D C A S H

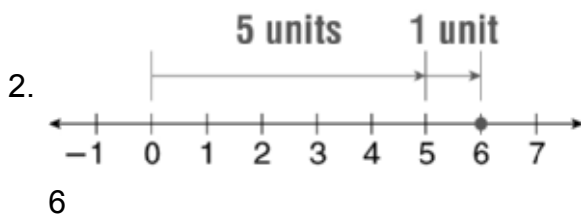
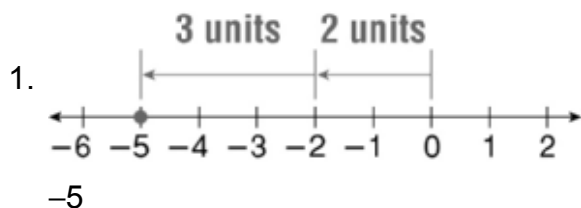
LESSON 2-3

Practice A



3. -7
4. -5
5. 6
6. 9
7. -16
8. 0
9. 1
10. 12
11. 7
12. 16
13. -11
14. 4
15. 9
16. -8
17. 3
18. -2
19. 0
20. -10
21. 9°F
22. 14°F

Practice B



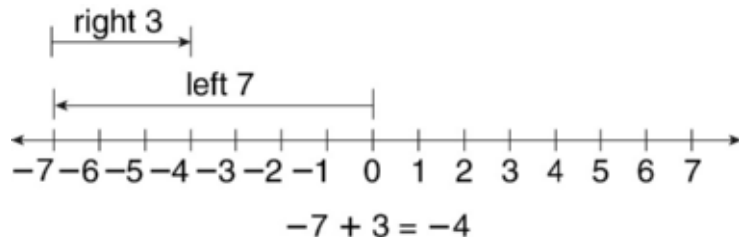
3. -10
4. 5
5. -4
6. 24
7. 0
8. 46

LESSON
2-3

Reading Strategies

Use Graphic Aids

Brett borrowed \$7 from his father to buy a CD. He paid back \$3. How much money does Brett have now? The number line will help you picture this problem.

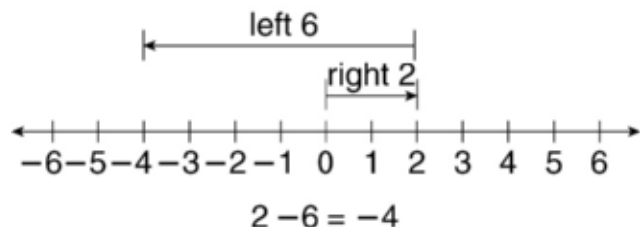


1. Beginning at 0, in which direction will you move first? _____
2. How many places? _____
3. Which direction do you move next? _____
4. How many places? _____
5. On what number do you end? _____

Bret does not have any money. He owes his dad \$4. He has negative \$4.

Sally and her friends made up a game with points. You can either win or lose up to ten points on each round of the game. After the first round, Sally's team had 2 points. In the second round they lost 6 points. How many points was Sally's team down by after the second round?

The number line will help you picture the problem.



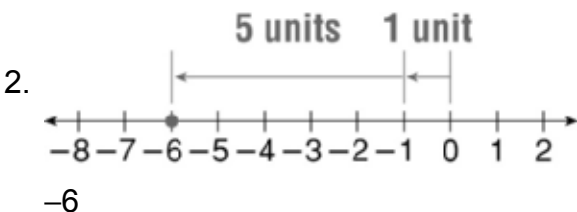
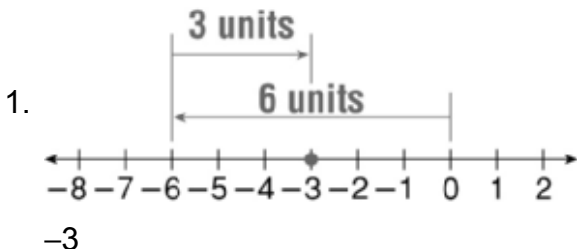
6. Beginning at zero, which direction will you move first? How many places?

7. Which direction will you move next? How many places?

8. By how many points was Sally's team down? _____

9. -1 10. 42
 11. -6 12. -26
 13. 30 14. -5
 15. 16 16. -22
 17. 7 18. 0
 19. 29 20. -5
 21. 4 °F 22. 7 °F

Practice C



3. -31 4. -12
 5. -16 6. 38
 7. 66 8. -74
 9. 0 10. -52
 11. -48 12. 10
 13. -7 14. -12
 15. 14 16. 0
 17. -20 18. 25
 19. -57 20. 144°F
 21. -5 °F

Review for Mastery

1. a. 5; b. -1; c. 20
 2. a. negative; b. 2; c. -2
 3. a. positive; b. 8; c. 8
 4. 40 5. -3
 6. -26 7. 0
 8. 31 9. -5

Challenge

Temperature Facts	°F
Louisiana's lowest	-16°
Texas's highest	120°
Fairbanks normal January	-10°
Tampa normal July	82°
Lowest in Detroit in 2000	-3°
Highest in Norfolk in 2000	96°
North Carolina's lowest	-34°
South Carolina's lowest	-19°

Highest and Lowest Points on Continents	Elevation
Death Valley, North America	-282 ft
Caspian Sea, Europe	-92 ft
Mount Everest, Asia	29,035 ft
Mount McKinley, North America	20,320 ft
Lake Eyre, Australia	-52 ft
Dead Sea, Asia	-1,348 ft
Mount Elbrus, Europe	18,510 ft
Lake Assal, Africa	-512 ft

Problem Solving

1. 610 °C 2. \$35,000
 3. \$118,000 4. 240 °C
 5. B 6. I
 7. D 8. F

Reading Strategies

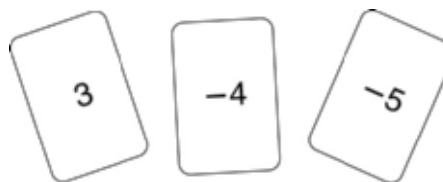
1. to the left 2. 7
 3. to the right 4. 3
 5. -4 6. to the right; 2
 7. to the left; 6 8. 4

LESSON
2-3

Review for Mastery

Subtracting Integers

The total value of the three cards shown is -6 .



What if you **take away** the 3 card?

Cards -4 and -5 are left.

The new value is -9 .

$$-6 - 3 = -9$$

What if you **take away** the -4 card?

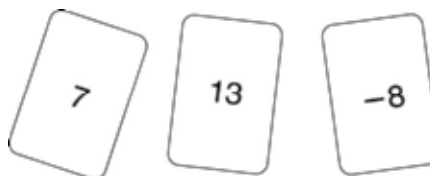
Cards 3 and -5 are left.

The new value is -2 .

$$-6 - (-4) = -2$$

Answer each question.

1. Suppose you have the cards shown.
The total value of the cards is 12.



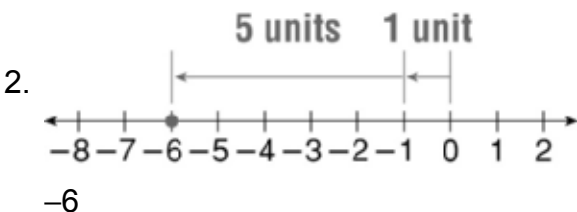
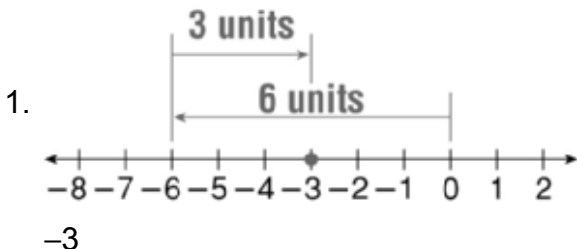
- a. What if you take away the 7 card? $12 - 7 =$ _____
- b. What if you take away the 13 card? $12 - 13 =$ _____
- c. What if you take away the -8 card? $12 - (-8) =$ _____
2. Subtract $-4 - (-2)$.
- a. $-4 < -2$. Will the answer be positive or negative? _____
- b. $|4| - |2| =$ _____
- c. $-4 - (-2) =$ _____
3. Subtract $21 - 13$.
- a. $21 > 13$. Will the answer be positive or negative? _____
- b. $|21| - |13| =$ _____
- c. $21 - 13 =$ _____

Subtract.

4. $31 - (-9) =$ _____
5. $15 - 18 =$ _____
6. $-9 - 17 =$ _____
7. $-8 - (-8) =$ _____
8. $29 - (-2) =$ _____
9. $13 - 18 =$ _____

9. -1 10. 42
 11. -6 12. -26
 13. 30 14. -5
 15. 16 16. -22
 17. 7 18. 0
 19. 29 20. -5
 21. 4 °F 22. 7 °F

Practice C



3. -31 4. -12
 5. -16 6. 38
 7. 66 8. -74
 9. 0 10. -52
 11. -48 12. 10
 13. -7 14. -12
 15. 14 16. 0
 17. -20 18. 25
 19. -57 20. 144°F
 21. -5 °F

Review for Mastery

1. a. 5; b. -1; c. 20
 2. a. negative; b. 2; c. -2
 3. a. positive; b. 8; c. 8
 4. 40 5. -3
 6. -26 7. 0
 8. 31 9. -5

Challenge

Temperature Facts	°F
Louisiana's lowest	-16°
Texas's highest	120°
Fairbanks normal January	-10°
Tampa normal July	82°
Lowest in Detroit in 2000	-3°
Highest in Norfolk in 2000	96°
North Carolina's lowest	-34°
South Carolina's lowest	-19°

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Lake Eyre, Australia	-52 ft
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Mount Elbrus, Europe	18,510 ft
Lake Assal, Africa	-512 ft

Problem Solving

1. 610 °C 2. \$35,000
 3. \$118,000 4. 240 °C
 5. B 6. I
 7. D 8. F

Reading Strategies

1. to the left 2. 7
 3. to the right 4. 3
 5. -4 6. to the right; 2
 7. to the left; 6 8. 4

Subtracting Integers**Steps for Success**

Step I Make sure that students understand the text in the lesson opener by using the following procedures.

- Discuss with students how a space shuttle re-enters the Earth's atmosphere. Explain the varying temperatures that the spacecraft has to endure and that engineers have to account for these vast temperature differences when designing a space shuttle.
- Refer students to Problem 1 on the worksheet. This corresponds to the lesson opener and Example 4 in the text. Use the thermometer to show the difference between the two temperatures.
- Explain that a thermometer is like a number line. Numbers above zero are positive temperatures, and numbers below zero are negative temperatures.
- Discuss why you add 3,000 and 250 to determine the temperature difference. Relate the difference to distance on a number line.

Step II Ask the students to complete the worksheet for this lesson.

- Point out that Problem 2 on the worksheet supports Example 2A and 2C in the student textbook.
- Ask students to explain the word *opposite*. Relate their ideas to the concept of "opposite numbers."
- Think and Discuss supports the worksheet.

Step III Teach the lesson.

Making Connections

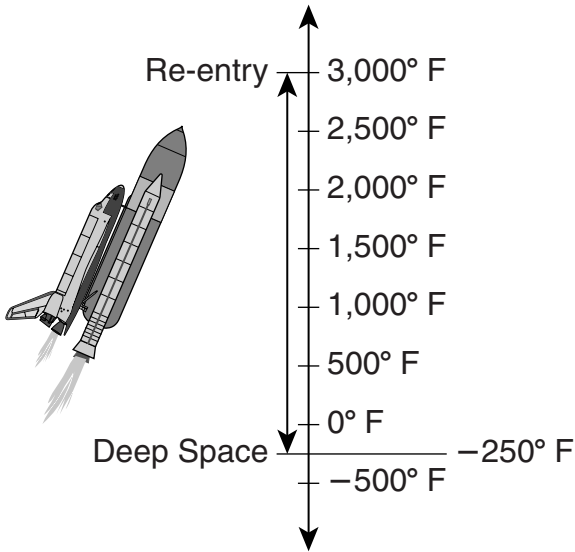
- To reinforce the idea of subtracting integers, use an example with elevation. For example, a skydiver jumps from a plane 200 feet above the water. When she hits the water she descends 20 feet below the surface of the water. Find the total distance the diver traveled from the plane.
- Create a large number line across the width of the classroom. Physically demonstrate the distance between two numbers. Place one student at 0, one at -6 and one at 2. Have the rest of the class determine the distance between the two "points." Repeat the demonstration with different students and different "points" on the number line.

LESSON

Student Worksheet

2-3 Subtracting Integers

Problem 1



Problem 2

—
means to
ADD
the opposite.

$$\begin{aligned} 5 - 9 &= 5 - (+9) \\ &= 5 + (-9) \\ &= -4 \end{aligned}$$

The opposite of
+ is —.
The opposite of
— is +.

$$\begin{aligned} -4 - 3 &= -4 + (-3) \\ &= -7 \end{aligned}$$

Think and Discuss

1. Why do you add $3,000^\circ$ and 250° in Problem 1?

2. In Problem 2, what is the opposite of 9? _____

3. Why do you not change the -4 to $+4$ in Problem 2?

4. Is $3 - 5$ the same as $5 - 3$? Explain.

Answers

Lesson 2-1

Think and Discuss

- 2
- 2

Lesson 2-2

Think and Discuss

- different signs
- add
- add; -9

Lesson 2-3

Think and Discuss

- When you find the difference between a positive number and a negative number, you add.
- -9
- You are not adding or subtracting -4 , you are subtracting 3 from -4 .
- No, they are opposites.

Lesson 2-4

Think and Discuss

- Because both numbers have the same sign. The quotient of two same signed numbers is positive.
- Yes; The quotient is -2 in both cases.

Lesson 2-5

Think and Discuss

- n
- use subtraction
- The equation is a true statement when $n = -13$.
- when $n = -1$
- when $n = 1$
- when $n = 1$
- when $n = -1$

Lesson 2-6

Think and Discuss

- The variable is not alone on one side.
- There are 12 months in the year.
- The coefficient of m would need to be 365.

Lesson 2-7

Think and Discuss

- 4
- It would be the same.

Lesson 2-8

Think and Discuss

- 1, 2, 3, 4, 6, and 12
- Because 6 is not the greatest factor that 24, 36, and 48 have in common.
- In both methods you are finding common factors, and determining the greatest factor that the numbers have in common.

Lesson 2-9

Think and Discuss

- It is the common multiple of both numbers with the least value.
- Because 2 is a factor common to both numbers.

Lesson 2-10

Think and Discuss

- Cher ate the same amount. $\frac{3}{4}$ is equivalent to $\frac{6}{8}$ and $\frac{9}{12}$.

Lesson 2-11

Think and Discuss

- terminating decimal; the decimal comes to an end.
- tenths
- thousandths = $\frac{36}{1,000}$
- Yes; $0.333 \dots$ is a repeating decimal and 0.3 is a terminating decimal.

Assignment Guide

If you finished **Example 1** assign:
Average 1–4, 13–20, 58–64
Advanced 13–20, 49, 58–64

If you finished **Example 2** assign:
Average 1–8, 13–28, 36–44, 56, 58–64
Advanced 13–28, 39–44, 49, 56, 58–64

If you finished **Example 3** assign:
Average 1–11, 13–34, 36–49, 56–64
Advanced 13–34, 36–49, 56–64

If you finished **Example 4** assign:
Average 1–41, 45–51, 56–60, 64
Advanced 13–35, 39–64

Homework Quick Check

Quickly check key concepts.
 Exercises: 14, 18, 22, 30, 32, 35

 = **WORKED-OUT SOLUTIONS**
 on p. WS3

 **Interactive Answers and Solutions**

Math Background

Subtraction is formally defined as addition of the opposite—or additive inverse. The integers are closed under the operations of addition and subtraction, which means that adding or subtracting any two integers will produce another integer.

Sunshine State Standards

Benchmark	Exercises
MA.7.A.3.1	1–57, 64
MA.7.A.3.2	1–57, 64
Rev. MA.6.A.3.1	58–61

GUIDED PRACTICE

See **Example 1** Use a number line to find each difference.

1. $4 - 7$ **-3** 2. $-6 - 5$ **-11** 3. $2 - (-4)$ **6** 4. $-8 - (-2)$ **-6**

See **Example 2** Find each difference.

5. $6 - 10$ **-4** 6. $-3 - (-8)$ **5** 7. $-1 - 9$ **-10** 8. $-12 - (-2)$ **-10**

See **Example 3** Evaluate $a - b$ for each set of values.

9. $a = 5, b = -2$ **7** 10. $a = -8, b = 6$ **-14** 11. $a = 4, b = 18$ **-14**

See **Example 4** 12. In 1980, in Great Falls, Montana, the temperature rose from -32 °F to 15 °F in seven minutes. How much did the temperature increase? **47 °F**

INDEPENDENT PRACTICE

See **Example 1** Use a number line to find each difference.

13. $7 - 12$ **-5** 14. $-5 - (-9)$ **4** 15. $2 - (-6)$ **8** 16. $7 - (-8)$ **15**
 17. $9 - (-3)$ **12** 18. $-4 - 10$ **-14** 19. $8 - (-8)$ **16** 20. $-3 - (-3)$ **0**

See **Example 2** Find each difference.

21. $-22 - (-5)$ **-17** 22. $-4 - 21$ **-25** 23. $27 - 19$ **8** 24. $-10 - (-7)$ **-3**
 25. $30 - (-20)$ **50** 26. $-15 - 15$ **-30** 27. $12 - (-6)$ **18** 28. $-31 - 15$ **-46**

See **Example 3** Evaluate $a - b$ for each set of values.

29. $a = 9, b = -7$ **16** 30. $a = -11, b = 2$ **-13** 31. $a = -2, b = 3$ **-5**
 32. $a = 8, b = 19$ **-11** 33. $a = -10, b = 10$ **-20** 34. $a = -4, b = -15$ **11**

See **Example 4** 35. In 1918, in Granville, North Dakota, the temperature rose from -33 °F to 50 °F in 12 hours. How much did the temperature increase? **83 °F**

PRACTICE AND PROBLEM SOLVING

Simplify.

36. $2 - 8$ **-6** 37. $-5 - 9$ **-14** 38. $15 - 12 - 8$ **-5**
 39. $6 + (-5) - 3$ **-2** 40. $1 - 8 + (-6)$ **-13** 41. $4 - (-7) - 9$ **2**
 42. $(2 - 3) - (5 - 6)$ **0** 43. $5 - (-8) - (-3)$ **16** 44. $10 - 12 + 2$ **0**

Evaluate each expression for $m = -5$, $n = 8$, and $p = -14$.

45. $m - n + p$ **-27** 46. $n - m - p$ **27** 47. $p - m - n$ **-17** 48. $m + n - p$ **17**
 49. **Patterns** Find the next three numbers in the pattern 7, 3, -1, -5, -9, ...
 Then describe the pattern. **-13, -17, -21; Subtract 4.**

REVIEW FOR MASTERY 2-3

LESSON 2-3 Review for Mastery

Subtracting Integers

The total value of the three cards shown is -6.



What if you take away the 3 card?
 Cards -4 and -5 are left.
 The new value is -9.
 $-6 - 3 = -9$

What if you take away the -4 card?
 Cards 3 and -5 are left.
 The new value is -2.
 $-6 - (-4) = -2$

Answer each question.

1. Suppose you have the cards shown.
 The total value of the cards is 12.



- a. What if you take away the 7 card? $12 - 7 = 5$
 b. What if you take away the 13 card? $12 - 13 = -1$
 c. What if you take away the -8 card? $12 - (-8) = 20$
2. Subtract $-4 - (-2)$.
 a. $-4 < -2$. Will the answer be positive or negative? **negative**
 b. $|4| - |2| = 2$
 c. $-4 - (-2) = -2$
3. Subtract $21 - 13$.
 a. $21 > 13$. Will the answer be positive or negative? **positive**
 b. $|21| - |13| = 8$
 c. $21 - 13 = 8$

Subtract.

4. $31 - (-9) = 40$ 5. $15 - 18 = -3$ 6. $-9 - 17 = -26$
 7. $-8 - (-8) = 0$ 8. $29 - (-2) = 31$ 9. $13 - 18 = -5$

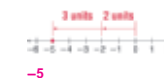
PRACTICE 2-3

LESSON 2-3 Practice B

Subtracting Integers

Use a number line to find each difference.

1. $-2 - 3$ 2. $5 - (-1)$



Find each difference.

3. $-6 - 4$ **-10** 4. $-7 - (-12)$ **5** 5. $12 - 16$ **-4** 6. $5 - (-19)$ **24**
 7. $-18 - (-18)$ **0** 8. $23 - (-23)$ **46** 9. $-10 - (-9)$ **-1** 10. $29 - (-13)$ **42**
 11. $9 - 15$ **-6** 12. $-12 - 14$ **-26** 13. $22 - (-8)$ **30** 14. $-16 - (-11)$ **-5**

Evaluate $x - y$ for each set of values.

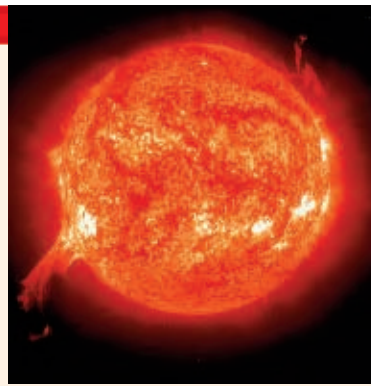
15. $x = 14, y = -2$ **16** 16. $x = -11, y = 11$ **-22** 17. $x = -8, y = -15$ **7**
 18. $x = -9, y = -9$ **0** 19. $x = 9, y = -20$ **29** 20. $x = 20, y = 25$ **-5**

21. The high temperature one day was -1 °F. The low temperature was -5 °F. What was the difference between the high and low temperatures for the day?
4 °F

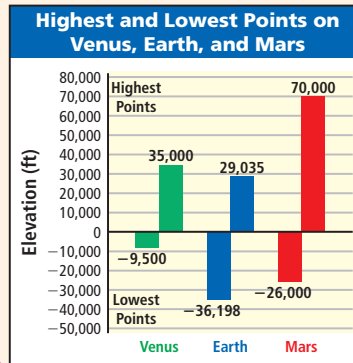
22. The temperature changed from 5 °F at 6 P.M. to -2 °F at midnight. How much did the temperature decrease?
7 °F



50. The temperature of Mercury can be as high as 873 °F. The temperature of Pluto is about -393 °F. What is the difference between these temperatures? **1,266 °F**
51. One side of Mercury always faces the Sun. The temperature on this side can reach 873 °F. The temperature on the other side can be as low as -361 °F. What is the difference between the two temperatures? **1,234 °F**
52. Earth's moon rotates relative to the Sun about once a month. The side facing the Sun at a given time can be as hot as 224 °F. The side away from the Sun can be as cold as -307 °F. What is the difference between these temperatures? **531 °F**
53. The highest recorded temperature on Earth is 136 °F. The lowest is -129 °F. What is the difference between these temperatures? **265 °F**



Temperatures in the Sun range from about 5,500 °C at its surface to more than 15 million °C at its core.



Use the graph for Exercises 54 and 55.

54. How much deeper is the deepest canyon on Mars than the deepest canyon on Venus? **16,500 ft**
55. **Challenge** What is the difference between Earth's highest mountain and its deepest ocean canyon? What is the difference between Mars' highest mountain and its deepest canyon? Which difference is greater? How much greater is it? **65,233 ft; 96,000 ft; 96,000 ft (Mars); 30,767 ft**

Astronomy

Exercises 50–55 involve temperature and elevation data from various planets.



For Exercise 56, students should first notice that the directions ask which

expression does NOT have a value of -3. If students miss this, they may immediately choose **A**. If students scan the answer choices, they will notice that **C** involves subtracting a negative number from a positive one. This choice results in a positive number.



Journal

Have students explain how to subtract a negative integer as if they were explaining it to another student who missed this lesson.

Florida Spiral Review

MA.7.A.3.1, MA.7.A.3.2

56. **Multiple Choice** Which expression does NOT have a value of -3?
A. $-2 - 1$ **B.** $10 - 13$ **C.** $5 - (-8)$ **D.** $-4 - (-1)$
57. **Extended Response** If $m = -2$ and $n = 4$, which expression has the least absolute value: $m + n$, $n - m$, or $m - n$? Explain your answer. **$m + n$ has the least absolute value. $m + n = 2$, and $|2| = 2$. $n - m = 6$, and $|6| = 6$. $m - n = -6$, and $|-6| = 6$.**
- Evaluate each expression for the given values of the variables. (Lesson 1-4)
58. $3x - 5$ for $x = 2$ **1** 59. $2n^2 + n$ for $n = 1$ **3** 60. $4y^2 - 3y$ for $y = 2$ **10**
61. $4a + 7$ for $a = 3$ **19** 62. $x^2 + 9$ for $x = 1$ **10** 63. $5z + z^2$ for $z = 3$ **24**
64. **Sports** In three plays, a football team gained 10 yards, lost 22 yards, and gained 15 yards. Use integer addition to find the team's total yardage for the three plays. (Lesson 2-2) **gain of 3 yards**

CHALLENGE 2-3

Challenge
LESSON 2-3 Subtract-a-Fact

Complete each temperature and elevation fact. Write the answer in the tables below.

Temperature Facts		Elevation Facts	
1. Louisiana's lowest recorded temperature is $(-15 - 1)^\circ\text{F}$.	-16°	9. Death Valley's elevation is $(-25 - 257)$ ft.	-282 ft
2. The highest recorded temperature for Texas is $(-18 - (-138))^\circ\text{F}$.	120°	10. The Caspian Sea's elevation is $(125 - 217)$ ft.	-92 ft
3. The normal January temperature for Fairbanks, Alaska, is $(-5 - 5)^\circ\text{F}$.	-10°	11. Mount Everest's elevation is $(-26 - (-29,061))$ ft.	29,035 ft
4. The normal July temperature for Tampa, Florida, is $(45 - (-37))^\circ\text{F}$.	82°	12. Mount McKinley's elevation is Mount Everest's elevation $- 8,715$ ft.	20,320 ft
5. The lowest temperature of 2000 in Detroit, Michigan, was $(87 - 90)^\circ\text{F}$.	-3°	13. Lake Eyre's elevation is $(68 - 120)$ ft.	-52 ft
6. The highest temperature of 2000 in Norfolk, Virginia, was $(-42 - (-138))^\circ\text{F}$.	96°	14. The Dead Sea's elevation is $(-761 - 587)$ ft.	-1,348 ft
7. North Carolina's lowest recorded temperature is $(57 - 91)^\circ\text{F}$.	-34°	15. Mount Everest's elevation is $(11,500 - (-7,010))$ ft.	18,510 ft
8. South Carolina's lowest recorded temperature is $(-4 - 15)^\circ\text{F}$.	-19°	16. Lake Assal's elevation is $(-254 - 258)$ ft.	-512 ft

PROBLEM SOLVING 2-3

Problem Solving
LESSON 2-3 Subtracting Integers

Write the correct answer.

- The daytime temperature on Mercury can reach 430 °C. The nighttime temperature can drop to -180 °C. How much did the temperature drop during one day? **610 °C**
- An ice cream company reported a net profit of \$24,000 in 2002 and a net loss of \$11,000 in 2003. How much did the company's profits change from 2002 to 2003? **\$35,000**
- A small business reported a net loss of \$86,000 in 2004 and a net profit of \$32,000 in 2005. How much did the company's profits change from 2004 to 2005? **\$118,000**
- Choose the letter for the best answer.
 - The low point of the Tonga Trench, in the Pacific Ocean, is -10,630 meters. The low point of the Mariana Trench, also in the Pacific Ocean, is 890 meters lower. What is the depth of the Mariana Trench?
A 10,630 meters
B -11,520 meters
C -9,740 meters
D 9,740 meters
 - On Wednesday night in St. Petersburg, Russia, the temperature is -11 °C. On the same night in Bombay, India, the temperature is 17 °C. What is the difference between the high and low temperatures?
F -6 °C
G 50 °C
H -187 °C
I 28 °C
 - The low point of the Japanese Trench, in the Pacific Ocean, is -10,372 meters. The low point of the Puerto Rico Trench, in the Atlantic Ocean, is 1,172 meters higher. What is the depth of the Puerto Rico Trench?
F -9,200 meters
G 8,200 meters
H -1,172 meters
I -11,544 meters
- Climax, Colorado, is the highest town in the United States at 11,560 feet. The lowest town is Calipatria, California, which is 185 feet below sea level. What is the difference in elevation?
A -185 feet
B 11,375 feet
C 11,560 feet
D 11,745 feet

Power Presentations with PowerPoint®

2-3 Lesson Quiz

- Use a number line to find the difference.
 $3 - 9$ **-6**
- Find each difference.
2. $-7 - 4$ **-11**
3. $-3 - (-5)$ **2**
- Evaluate $x - y + z$ for $x = -4$, $y = 5$, and $z = -10$. **-19**
- On January 1, the high temperature was 81 °F in Kona, Hawaii. The low temperature was -29 °F in Barrow, Alaska. What was the difference between the two temperatures? **110 °F**

Also available on transparency



LESSON

2-4

Practice A***Multiplying and Dividing Integers*****Find each product.**

1. $6 \cdot (-1)$

2. $-4 \cdot 2$

3. $-3 \cdot (-4)$

4. $-2 \cdot 8$

5. $5 \cdot (-7)$

6. $-7 \cdot 9$

7. $8 \cdot 4$

8. $-3 \cdot (-5)$

9. $-5 \cdot (-5)$

10. $8 \cdot (-4)$

11. $-7 \cdot (-6)$

12. $9 \cdot (-8)$

13. $1 \cdot (-7)$

14. $-4 \cdot (-5)$

15. $-6 \cdot 3$

16. $-7 \cdot (-7)$

Find each quotient.

17. $12 \div (-4)$

18. $-15 \div (-3)$

19. $-20 \div 5$

20. $-27 \div (-9)$

21. $-45 \div (-5)$

22. $-18 \div 9$

23. $24 \div (-4)$

24. $32 \div 4$

25. $21 \div 3$

26. $-36 \div (-4)$

27. $16 \div (-4)$

28. $-56 \div 8$

29. $-42 \div 7$

30. $-30 \div (-6)$

31. $27 \div 9$

32. $25 \div 0$

33. A scientist is measuring the temperature change in a chemical compound. The temperature dropped 11°F per hour from the original temperature. After 4 hours, the temperature was 90°F . Find the compound's original temperature.

34. A mountain climber ascends 800 feet per hour from his original position. After 6 hours, his final position is 11,600 feet above sea level. Find the climber's original position.

Puzzles, Twisters & Teasers

C: -10
 A: -9
 J: 5
 N: -4
 B: -46
 U: 18
 O: -30
 I: 50
 G: -17
 D: -25
 Y: 8
 E: -3
 R: -7
 T: -14
 F: -6

A N U N I D E N T I F I E D
 F R Y I N G O B J E C T

LESSON 2-4**Practice A**

1. -6	2. -8
3. 12	4. -16
5. -35	6. -63
7. 32	8. 15
9. 25	10. -32
11. 42	12. -72
13. -7	14. 20
15. -18	16. 49
17. -3	18. 5
19. -4	20. 3
21. 9	22. -2
23. -6	24. 8
25. 7	26. 9
27. -4	28. -7
29. -6	30. 5
31. 3	32. undefined
33. 133 °F	34. 6,800 feet

Practice B

1. -40	2. -28
3. 18	4. -8
5. -36	6. -45
7. 48	8. 21
9. 36	10. -27
11. 16	12. -35
13. 80	14. -45
15. -54	16. 44
17. -5	18. 9
19. -2	20. 7
21. 6	22. undefined
23. -6	24. 9
25. -4	26. -5
27. 9	28. 5
29. -7	30. 8
31. 5	32. undefined
33. \$603	34. 69 °F

Practice C

1. -72	2. -49
3. 30	4. -32
5. -120	6. -150
7. 80	8. 120
9. 35	10. -90
11. 64	12. -36
13. -72	14. -60
15. 125	16. -300
17. -9	18. 12
19. -4	20. 9
21. 8	22. undefined
23. -8	24. 5
25. -11	26. -5
27. 25	28. 12
29. -4	30. 20
31. 4	32. undefined
33. 17 feet below sea level	34. \$850

LESSON
2-4

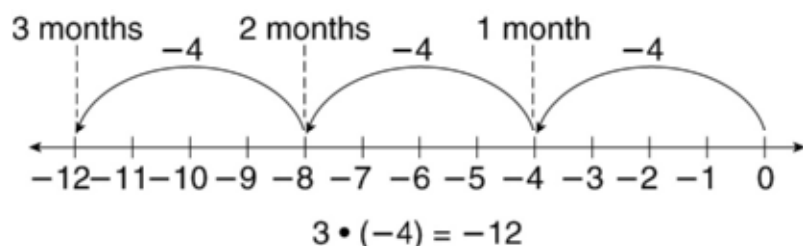
Reading Strategies

Use Graphic Aids

The opposite of 5 is negative 5. Owing money is the opposite of having money. Owing \$5 is the opposite of having \$5.

1. What is the opposite of owing \$10? _____
2. What is the opposite of having \$17? _____

David borrowed \$4 from his mother each of the last three months. How much money does he owe his mother? The money he owes his mother is a negative number. This problem can be pictured on a number line.



Use the number line to help you answer the questions.

3. Starting at zero, which direction do you move first? _____
4. How many places do you move? _____
5. Which direction do you move next? _____
6. How many places do you move? _____
7. Which direction do you move next? _____
8. How many places do you move? _____
9. How much money does David owe his mother? _____
10. If David borrowed \$4 for one more month, how much would he owe his mother? _____

Review for Mastery

- | | |
|--------|--------|
| 1. -20 | 2. -16 |
| 3. 1 | 4. -18 |
| 5. -21 | 6. 32 |
| 7. -30 | 8. 81 |
| 9. -9 | 10. -3 |
| 11. 4 | 12. -6 |
| 13. 3 | 14. -4 |
| 15. -5 | 16. 4 |

Challenge

Phil	Sam
85 yd	106 yd
-1,282 yd	-1,482 yd
-1,197 yd	-1,376 yd
-74.8 yd	-86 yd
	✓

Problem Solving

- | | |
|-------------------------|-------------------------|
| 1. -2°F | 2. 1°F |
| 3. 3°F | 4. -1°F |
| 5. C | 6. H |
| 7. C | 8. H |

Reading Strategies

- | | |
|----------------|---------------|
| 1. having \$10 | 2. owing \$17 |
| 3. to the left | 4. 4 |
| 5. to the left | 6. 4 |
| 7. to the left | 8. 4 |
| 9. \$12 | 10. \$16 |

Puzzles, Twisters & Teasers

- H: -9
 E: 8
 N: -8
 T: -12
 I: 9
 S: -6
 C: -4

G: 6

A: 12

R: 10

**WHEN THERE IS CHANGE
IN THE WEATHER****LESSON 2-5****Practice A**

- | | |
|---------------|-------------------------|
| 1. $n = 4$ | 2. $x = -3$ |
| 3. $a = 12$ | 4. $y = -2$ |
| 5. $c = -10$ | 6. $v = -1$ |
| 7. $j = -2$ | 8. $k = -8$ |
| 9. $s = 5$ | 10. $m = 10$ |
| 11. $d = -18$ | 12. $r = -28$ |
| 13. $p = -14$ | 14. $b = -3$ |
| 15. $f = 8$ | 16. $n = -24$ |
| 17. $k = -7$ | 18. $a = -4$ |
| 19. $x = 6$ | 20. $e = 9$ |
| 21. $m = 6$ | 22. 4°F |
| 23. \$20 | |

Practice B

- | | |
|---------------|---------------------------|
| 1. $y = 1$ | 2. $n = -5$ |
| 3. $x = 28$ | 4. $p = -4$ |
| 5. $q = -8$ | 6. $w = -4$ |
| 7. $h = -4$ | 8. $b = -12$ |
| 9. $u = 25$ | 10. $d = -35$ |
| 11. $c = -80$ | 12. $s = -81$ |
| 13. $f = -31$ | 14. $v = -25$ |
| 15. $g = -2$ | 16. $s = 7$ |
| 17. $m = -24$ | 18. $w = 48$ |
| 19. $x = -16$ | 20. $e = -56$ |
| 21. $n = 27$ | 22. -44°F |
| 23. \$10 | |

Practice C

- | | |
|-------------|--------------|
| 1. $h = -2$ | 2. $a = 17$ |
| 3. $g = 33$ | 4. $m = -17$ |

LESSON

2-4

Review for Mastery

Multiplying and Dividing Integers

Look for the patterns in these products and quotients.

$$\begin{array}{cccc}
 1 \cdot 3 = 3 & -1 \cdot 3 = -3 & 3 \div 1 = 3 & 3 \div (-1) = -3 \\
 2 \cdot 3 = 6 & -2 \cdot 3 = -6 & 6 \div 2 = 3 & 6 \div (-2) = -3 \\
 -3 \cdot (-3) = 9 & 3 \cdot (-3) = -9 & -9 \div (-3) = 3 & -9 \div 3 = -3 \\
 -4 \cdot (-3) = 12 & 4 \cdot (-3) = -12 & -12 \div (-4) = 3 & -12 \div 4 = -3
 \end{array}$$

Look at how to find the signs of the products.

- The product of two integers with the **same sign** is **positive**.

$$(+)\cdot(+)=(+)\qquad (-)\cdot(-)=(+)$$

- The product of two integers with **different signs** is **negative**.

$$(+)\cdot(-)=(-)\qquad (-)\cdot(+)=(-)$$

Look at how to find the signs of the quotients.

- The quotient of two integers with the **same sign** is **positive**.

$$(+)\div(+)=(+)\qquad (-)\div(-)=(+)$$

- The quotient of two integers with **different signs** is **negative**.

$$(+)\div(-)=(-)\qquad (-)\div(+)=(-)$$

Find each product or quotient.

1. $-5 \cdot 4$

2. $2 \cdot (-8)$

3. $-1 \cdot (-1)$

4. $-6 \cdot 3$

5. $7 \cdot (-3)$

6. $-8 \cdot (-4)$

7. $-6 \cdot 5$

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

9. $36 \div (-4)$

10. $-27 \div 9$

11. $-24 \div (-6)$

12. $-30 \div 5$

13. $18 \div 6$

14. $32 \div (-8)$

15. $-45 \div 9$

16. $-40 \div (-10)$

Review for Mastery

- | | |
|--------|--------|
| 1. -20 | 2. -16 |
| 3. 1 | 4. -18 |
| 5. -21 | 6. 32 |
| 7. -30 | 8. 81 |
| 9. -9 | 10. -3 |
| 11. 4 | 12. -6 |
| 13. 3 | 14. -4 |
| 15. -5 | 16. 4 |

Challenge

Phil	Sam
85 yd	106 yd
-1,282 yd	-1,482 yd
-1,197 yd	-1,376 yd
-74.8 yd	-86 yd
	✓

Problem Solving

- | | |
|-------------------------|-------------------------|
| 1. -2°F | 2. 1°F |
| 3. 3°F | 4. -1°F |
| 5. C | 6. H |
| 7. C | 8. H |

Reading Strategies

- | | |
|----------------|---------------|
| 1. having \$10 | 2. owing \$17 |
| 3. to the left | 4. 4 |
| 5. to the left | 6. 4 |
| 7. to the left | 8. 4 |
| 9. \$12 | 10. \$16 |

Puzzles, Twisters & Teasers

- H: -9
 E: 8
 N: -8
 T: -12
 I: 9
 S: -6
 C: -4

G: 6

A: 12

R: 10

**WHEN THERE IS CHANGE
IN THE WEATHER****LESSON 2-5****Practice A**

- | | |
|---------------|-------------------------|
| 1. $n = 4$ | 2. $x = -3$ |
| 3. $a = 12$ | 4. $y = -2$ |
| 5. $c = -10$ | 6. $v = -1$ |
| 7. $j = -2$ | 8. $k = -8$ |
| 9. $s = 5$ | 10. $m = 10$ |
| 11. $d = -18$ | 12. $r = -28$ |
| 13. $p = -14$ | 14. $b = -3$ |
| 15. $f = 8$ | 16. $n = -24$ |
| 17. $k = -7$ | 18. $a = -4$ |
| 19. $x = 6$ | 20. $e = 9$ |
| 21. $m = 6$ | 22. 4°F |
| 23. \$20 | |

Practice B

- | | |
|---------------|---------------------------|
| 1. $y = 1$ | 2. $n = -5$ |
| 3. $x = 28$ | 4. $p = -4$ |
| 5. $q = -8$ | 6. $w = -4$ |
| 7. $h = -4$ | 8. $b = -12$ |
| 9. $u = 25$ | 10. $d = -35$ |
| 11. $c = -80$ | 12. $s = -81$ |
| 13. $f = -31$ | 14. $v = -25$ |
| 15. $g = -2$ | 16. $s = 7$ |
| 17. $m = -24$ | 18. $w = 48$ |
| 19. $x = -16$ | 20. $e = -56$ |
| 21. $n = 27$ | 22. -44°F |
| 23. \$10 | |

Practice C

- | | |
|-------------|--------------|
| 1. $h = -2$ | 2. $a = 17$ |
| 3. $g = 33$ | 4. $m = -17$ |

Steps for Success

Step I Review multiplication of whole numbers.

- Reassure students that the process of multiplying and dividing integers is the same as with whole numbers except that the product or quotient has a positive or negative sign.

Step II Ask the students to complete the worksheet for this lesson. Point out the following.

- Problem 1 on the worksheet corresponds to the rules given in the student textbook for multiplying and dividing integers. Slowly call out two numbers and an operation, giving emphasis to the words “positive” and “negative” (“negative 3 times negative 2”). Have students place a finger on the rule that leads to the correct sign of the product.
- Problem 2 on the worksheet supports Example 3B in the student textbook. Ask students if the 100 is a positive or negative number. Then ask if the 5 is a positive or negative number. Have students write the sign of each number directly below each number. Discuss why they think the quotient is positive or negative. Ask students to point to the rule in Problem 1 that applies to this problem.
- Think and Discuss supports the worksheet.

Step III Teach the lesson.

Making Connections

- Verify that students understand that the product of a positive and a negative number is less than the product of the exact two numbers with the same sign, both being positive, or both being negative, by having them compare the products on a number line.
For instance, $-3 \times 4 = -12$ and $-3 \times -4 = 12$. $-12 < 12$
- Use a large number line to physically demonstrate repeated subtraction. Relate this concept to the product of a positive number and a negative number; $4 \times -3 = -3 - 3 - 3 - 3 = -12$.
- Have students write positive and negative numbers from 1 to 15 on index cards. Working in pairs, have students place the cards face down. One student turns over two cards and has to find the product of the two numbers and state whether the product is positive or negative.
- As students begin the application problems, discuss unknown vocabulary. Come up with similar meaning words to make the problems easier to solve.

LESSON

Student Worksheet**2-4****Multiplying and Dividing Integers****Problem 1**

The rules for multiplying and dividing integers are the same.

Same signs \longrightarrow Positive

$$\begin{array}{ll} (+) \cdot (+) = + & (-) \cdot (-) = + \\ (+) \div (+) = + & (-) \div (-) = + \end{array}$$

Different signs \longrightarrow Negative

$$\begin{array}{ll} (-) \cdot (+) = - & (+) \cdot (-) = - \\ (+) \div (-) = - & (-) \div (+) = - \end{array}$$

Determine if each product or quotient is positive, +, or negative, -.

$$(-3) \cdot (-3) \longrightarrow \text{positive, +}$$

$$6 \div (-3) \longrightarrow \text{negative, -}$$

Problem 2

When dividing integers, follow these steps:

1. Divide the integers.
2. Look at the signs of each number to give the answer a sign.

$$-100 \div (-5)$$

Think: $- \div - = +$

$$-100 \div (-5) = +20$$

Think and Discuss

1. Why is the quotient of $-100 \div (-5)$ the same as the quotient of $100 \div 5$?

2. Is $6 \div (-3)$ the same as $-6 \div 3$? Explain.

Answers

Lesson 2-1

Think and Discuss

- 2
- 2

Lesson 2-2

Think and Discuss

- different signs
- add
- add; -9

Lesson 2-3

Think and Discuss

- When you find the difference between a positive number and a negative number, you add.
- -9
- You are not adding or subtracting -4 , you are subtracting 3 from -4 .
- No, they are opposites.

Lesson 2-4

Think and Discuss

- Because both numbers have the same sign. The quotient of two same signed numbers is positive.
- Yes; The quotient is -2 in both cases.

Lesson 2-5

Think and Discuss

- n
- use subtraction
- The equation is a true statement when $n = -13$.
- when $n = -1$
- when $n = 1$
- when $n = 1$
- when $n = -1$

Lesson 2-6

Think and Discuss

- The variable is not alone on one side.
- There are 12 months in the year.
- The coefficient of m would need to be 365.

Lesson 2-7

Think and Discuss

- 4
- It would be the same.

Lesson 2-8

Think and Discuss

- 1, 2, 3, 4, 6, and 12
- Because 6 is not the greatest factor that 24, 36, and 48 have in common.
- In both methods you are finding common factors, and determining the greatest factor that the numbers have in common.

Lesson 2-9

Think and Discuss

- It is the common multiple of both numbers with the least value.
- Because 2 is a factor common to both numbers.

Lesson 2-10

Think and Discuss

- Cher ate the same amount. $\frac{3}{4}$ is equivalent to $\frac{6}{8}$ and $\frac{9}{12}$.

Lesson 2-11

Think and Discuss

- terminating decimal; the decimal comes to an end.
- tenths
- thousandths = $\frac{36}{1,000}$
- Yes; $0.333 \dots$ is a repeating decimal and 0.3 is a terminating decimal.

LESSON

2-11

Practice A***Equivalent Fractions and Decimals***

Write each fraction as a decimal. Round to the nearest hundredth, if necessary.

1. $\frac{2}{3}$ _____

2. $\frac{9}{20}$ _____

3. $\frac{3}{4}$ _____

4. $\frac{20}{25}$ _____

5. $\frac{3}{8}$ _____

6. $\frac{7}{5}$ _____

7. $\frac{21}{7}$ _____

8. $\frac{5}{3}$ _____

9. $\frac{4}{9}$ _____

10. $\frac{4}{5}$ _____

11. $\frac{1}{25}$ _____

12. $\frac{3}{20}$ _____

Write each decimal as a fraction or mixed number in simplest form.

13. 0.55

14. 0.03

15. -0.75

16. 2.1

17. 5.25

18. 9.33

19. 1.8

20. -1.74

21. 10.6

22. -7.08

23. 0.625

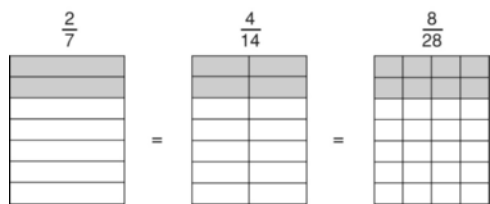
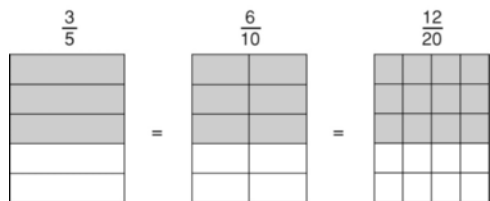
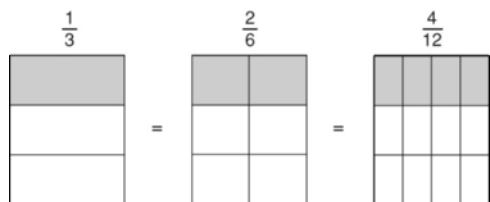
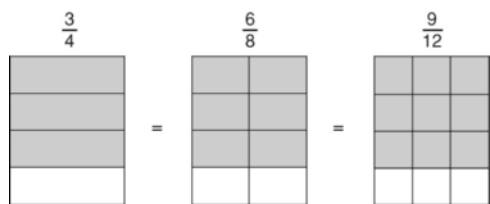
24. 0.001

Write each answer as a decimal rounded to the nearest thousandth.

25. Out of 45 times at bat, Raul got 19 hits. Find Raul's batting average.

26. On a test, Selena answered 26 out of 30 questions correctly. What portion of her answers was correct?

Puzzles, Twisters & Teasers



IT SAW THE
SALAD DRESSING

LESSON 2-11

Practice A

- | | |
|--------------------------------------|--|
| 1. 0.67 | 2. 0.45 |
| 3. 0.75 | 4. 0.8 |
| 5. 0.375 | 6. 1.4 |
| 7. 3.0 | 8. 1.67 |
| 9. 0.44 | 10. 0.8 |
| 11. 0.04 | 12. 0.15 |
| 13. $\frac{11}{20}$ | 14. $\frac{3}{100}$ |
| 15. $-\frac{3}{4}$ | 16. $2\frac{1}{10}$ or $\frac{21}{10}$ |
| 17. $5\frac{1}{4}$ or $\frac{21}{4}$ | 18. $9\frac{33}{100}$ or $\frac{933}{100}$ |
| 19. $\frac{9}{5}$ or $1\frac{4}{5}$ | 20. $-\frac{87}{50}$ or $-1\frac{37}{50}$ |

21. $\frac{53}{5}$ or $10\frac{3}{5}$

23. $\frac{5}{8}$

25. 0.422

Practice B

- 0.278
- 0.625
- 3.167
- 1.083
- 1.75
- 0.136

13. $\frac{17}{20}$

15. $-\frac{1}{4}$

17. $7\frac{3}{4}$ or $\frac{31}{4}$

19. $-1\frac{3}{50}$ or $-\frac{53}{50}$

21. $-2\frac{13}{20}$ or $-\frac{53}{20}$

23. $1\frac{3}{25}$ or $\frac{28}{25}$

25. 0.063

Practice C

- 0.417
- 3.571
- 5.667
- 1.667
- 0.714
- 0.259

13. $\frac{1}{4}$

15. $-\frac{13}{20}$

22. $-7\frac{2}{25}$ or $-\frac{177}{25}$

24. $\frac{1}{1,000}$

26. 0.867

2. 0.95

4. 2.2

6. 4.25

8. 4.286

10. 0.889

12. 0.08

14. $\frac{11}{100}$

16. $4\frac{3}{10}$ or $\frac{43}{10}$

18. $5\frac{3}{100}$ or $\frac{503}{100}$

20. $\frac{3}{8}$

22. $-5\frac{3}{5}$ or $-\frac{28}{5}$

24. $\frac{1}{200}$

26. 0.853

2. 4.75

4. 1.125

6. 1.182

8. 2.308

10. 0.52

12. 5.25

14. $\frac{13}{100}$

16. $4\frac{4}{5}$ or $\frac{24}{5}$

LESSON
2-11

Reading Strategies

Compare and Contrast

Compare what happens when fractions are changed to decimals.

$\frac{2}{5}$ • Read $\frac{2}{5}$ as “2 divided by 5.” • Write $\longrightarrow 2 \div 5$

Change a fraction to a decimal by dividing the numerator by the denominator.

$$\begin{array}{r} 0.4 \\ 5 \overline{)2.0} \\ \underline{-20} \\ 0 \end{array}$$

$\frac{2}{5} = 0.4$ The dividing ends, or terminates, with no remainder.
0.4 is called a terminating decimal.

1. Is there a remainder in the problem? How do you know?

2. What do we call a decimal that ends with no remainder?

$\frac{2}{6}$ • Read $\frac{2}{6}$ as “2 divided by 6.” • Write $\longrightarrow 2 \div 6$

$$\begin{array}{r} 0.333 \\ 6 \overline{)2.000} \\ \underline{-18} \\ 20 \\ \underline{-18} \\ 20 \\ \underline{-18} \\ 2 \end{array}$$

$\frac{2}{6} = 0.333 \dots$ or $0.\overline{3}$

← Note how dividing continues in a pattern. The number 0.333 . . . is a repeating decimal. The bar over the 3 means 3 repeats.

Answer each question.

3. Compare the division of $\frac{2}{5}$ to the division of $\frac{2}{6}$. What is the difference?

4. What is the name for a decimal with a remainder that has a repeating pattern?

17. $1\frac{7}{8}$ or $\frac{15}{8}$ 18. $9\frac{3}{50}$ or $\frac{453}{50}$
 19. $-1\frac{1}{125}$ or $-\frac{126}{125}$ 20. $\frac{5}{8}$
 21. $-2\frac{1}{20}$ or $-\frac{41}{20}$ 22. no
 23. yes 24. no
 25. 0.115 26. $\frac{4,256}{14,053}$, 0.303

Review for Mastery

1. 0.4; 0.4 2. 0.75
 20
 0
 3. 0.875 4. 1.5
 5. 1.667 6. $\frac{4}{5}$
 7. $\frac{9}{4}$ or $2\frac{1}{4}$ 8. $-\frac{1}{50}$

Challenge

1. r 2. n
 3. r 4. n
 5. n 6. n
 7. r 8. r
 9. n 10. n
 11. r 12. n
 13. 0.01020304...
 14. 8.63633633363333...
 15. 25.12123123412345...
 16. 9.98979695...
 17. Possible answer: 1.2222...
 18. Possible answer: 1.191991999...

Problem Solving

1. 0.925 2. 0.071
 3. 1.4 in. 4. 0.797
 5. D 6. H
 7. C 8. I

Reading Strategies

- No. Possible answer: When you subtract 20 from 20 there is a remainder of 0.
- a terminating decimal
- Possible answer: There is a remainder when dividing 2 by 6, but no remainder when dividing 2 by 5.
- repeating decimal

Puzzles, Twisters & Teasers



I C D K (I see decay.)

LESSON 3-1

Practice A

1. < 2. <
 3. > 4. <
 5. < 6. >
 7. < 8. >
 9. > 10. <
 11. < 12. <
 13. 0.5, $0.\bar{5}$, $\frac{5}{8}$ 14. 1.3, $1\frac{1}{3}$, 1.34
 15. 2.07, 2.67, $2\frac{7}{10}$
 16. -4.8, $-4\frac{1}{8}$, -4.08

LESSON
2-11

Review for Mastery
Equivalent Fractions and Decimals

To write a fraction as a decimal, divide the numerator of the fraction by the denominator of the fraction.

Write $\frac{3}{7}$ as a decimal.

- Divide 3 by 7.
- To round your answer to the nearest hundredth, add 3 zeros after the decimal point in the divisor.

0.428 rounded to the nearest hundredth is 0.43.

$$\begin{array}{r} 0.428 \\ 7 \overline{)3.000} \\ \underline{-28} \downarrow \\ 20 \\ \underline{-14} \downarrow \\ 60 \\ \underline{-56} \\ 4 \end{array}$$

1. Write $\frac{2}{5}$ as a decimal.

$\frac{2}{5} =$ _____

$$\begin{array}{r} 5 \overline{)2.0} \\ \underline{} \\ \end{array}$$

Write each fraction as a decimal. Round to the nearest thousandth, if necessary.

2. $\frac{3}{4}$ _____

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

4. $\frac{3}{2}$ _____

5. $\frac{5}{3}$ _____

To write a decimal as a fraction:

Step 1: Use place value to read the decimal. Say the number aloud.

Step 2: Write a fraction for the number you just said.

Step 3: Simplify if necessary.

Write 0.005 as a fraction.

Read 0.005 as “five thousandths.”

Write $\frac{5}{1000}$ for five thousandths.

Simplify: $\frac{5 \div 5}{1,000 \div 5} = \frac{1}{200}$

Write 1.6 as a fraction.

Read 1.6 as “one and six tenths.”

Write $1\frac{6}{10}$ for one and six tenths.

Simplify: $1\frac{6 \div 2}{10 \div 2} = 1\frac{3}{5}$

Write each decimal as a fraction or mixed number in simplest form.

6. 0.8 _____

7. 2.25 _____

8. -0.02 _____

17. $1\frac{7}{8}$ or $\frac{15}{8}$ 18. $9\frac{3}{50}$ or $\frac{453}{50}$
 19. $-1\frac{1}{125}$ or $-\frac{126}{125}$ 20. $\frac{5}{8}$
 21. $-2\frac{1}{20}$ or $-\frac{41}{20}$ 22. no
 23. yes 24. no
 25. 0.115 26. $\frac{4,256}{14,053}$, 0.303

Review for Mastery

1. 0.4; 0.4 2. 0.75
 20
 0
 3. 0.875 4. 1.5
 5. 1.667 6. $\frac{4}{5}$
 7. $\frac{9}{4}$ or $2\frac{1}{4}$ 8. $-\frac{1}{50}$

Challenge

1. r 2. n
 3. r 4. n
 5. n 6. n
 7. r 8. r
 9. n 10. n
 11. r 12. n
 13. 0.01020304...
 14. 8.63633633363333...
 15. 25.12123123412345...
 16. 9.98979695...
 17. Possible answer: 1.2222...
 18. Possible answer: 1.191991999...

Problem Solving

1. 0.925 2. 0.071
 3. 1.4 in. 4. 0.797
 5. D 6. H
 7. C 8. I

Reading Strategies

- No. Possible answer: When you subtract 20 from 20 there is a remainder of 0.
- a terminating decimal
- Possible answer: There is a remainder when dividing 2 by 6, but no remainder when dividing 2 by 5.
- repeating decimal

Puzzles, Twisters & Teasers



I C D K (I see decay.)

LESSON 3-1

Practice A

1. < 2. <
 3. > 4. <
 5. < 6. >
 7. < 8. >
 9. > 10. <
 11. < 12. <
 13. 0.5, $0.\overline{5}$, $\frac{5}{8}$ 14. 1.3, $1\frac{1}{3}$, 1.34
 15. 2.07, 2.67, $2\frac{7}{10}$
 16. -4.8, $-4\frac{1}{8}$, -4.08

2-11 *Equivalent Fractions and Decimals***Steps for Success**

Step I Make sure that students understand the text in the lesson opener by using the following procedures.

- Ask for a couple of volunteers to explain batting averages to the class. Encourage the student(s) to give examples of professional baseball players, or their own batting average. Discuss the game of baseball and explain the meaning of batting average, at bat, and hit.
- Refer students to Problem 1 on the Student Worksheet. This is similar to the lesson opener.
- Explain that the total number of times a player actually gets a base hit goes into the top of the fraction, the numerator, and the total number of times a player “attempts” to hit a ball goes into the bottom of the fraction, the denominator.

Step II Teach the lesson.

- Ask students to explain the word *terminate*. Relate their ideas to the concept of “terminating decimals”.
- Ask students to explain the word *repeat*. Relate their ideas to the concept of “repeating decimals”.

Step III Ask the students to complete the worksheet for this lesson.

- Point out that Problem 2 on the worksheet supports Example 3A in the student textbook.
- Think and Discuss supports the worksheet.

Making Connections

- Have students look up their favorite baseball player’s batting average. Have them write out the meaning of the average in words. Then have students show the average as a fraction.
- Set up a small basketball hoop in your classroom. Pick four students and have them try 3, 4, 5, and 6 times, respectively, to get the ball in the hoop from a specified distance away. Direct the rest of the students to keep track of how many times the ball goes in the hoop versus how many times the student attempted the toss. Have students create a list of “tossing averages” for each of the four players.
- Display a place value chart in the classroom so that students can refer to it when writing decimals as fractions.

LESSON
2-11 **Student Worksheet**
Equivalent Fractions and Decimals

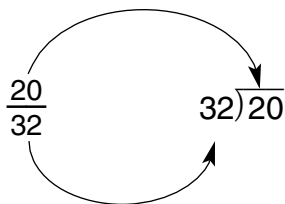
Problem 1



So far, I have 20 hits out of 32 at bats. What is my average?

$$\begin{aligned} \text{Average} &= \frac{\text{hits}}{\text{at bats}} \\ &= \frac{20}{32} \end{aligned}$$

$\frac{20}{32} =$ What decimal?



$$\begin{array}{r} \frac{20}{32} = 32 \overline{)20} = 32 \overline{)20.000} \\ \underline{-192} \\ 80 \\ \underline{-64} \\ 160 \\ \underline{-160} \\ 0 \end{array}$$

His batting average is 0.625.

Problem 2



What is 0.036?

6 is in the "thousandths" position on the place value chart.

$$\begin{aligned} 0.036 &\longrightarrow \frac{36}{1,000} \\ \frac{36}{1,000} \div 4 &= \frac{9}{250} \end{aligned}$$

Think and Discuss

1. Is the baseball average in Problem 1 a terminating or repeating decimal? Explain.

2. What is the place value of the 6 in 0.625? _____

3. Complete: 0.036 = thirty-six- _____

4. Are these two decimals different? Explain.

0.333333333333... **0.3**

Answers

Lesson 2-1

Think and Discuss

- 2
- 2
- Possible answer: 1 and -1

Lesson 2-2

Think and Discuss

- different signs
- add
- add; -9

Lesson 2-3

Think and Discuss

- When you find the difference between a positive number and a negative number, you add.
- -9
- You are not adding or subtracting -4 , you are subtracting 3 from -4 .
- No, they are opposites.

Lesson 2-4

Think and Discuss

- Because both numbers have the same sign. The quotient of two same signed numbers is positive.
- Yes; The quotient is -2 in both cases.

Lesson 2-5

Think and Discuss

- n
- use subtraction
- The equation is a true statement when $n = -13$.
- when $n = -1$
- when $n = 1$
- when $n = 1$
- when $n = -1$

Lesson 2-6

Think and Discuss

- The variable is not alone on one side.
- There are 12 months in the year.
- The coefficient of m would need to be 365.

Lesson 2-7

Think and Discuss

- 4
- It would be the same.

Lesson 2-8

Think and Discuss

- 1, 2, 3, 4, 6, and 12
- Because 6 is not the greatest factor that 24, 36, and 48 have in common.
- In both methods you are finding common factors, and determining the greatest factor that the numbers have in common.

Lesson 2-9

Think and Discuss

- It is the common multiple of both numbers with the least value.
- Because 2 is a factor common to both numbers.

Lesson 2-10

Think and Discuss

- Cher ate the same amount. $\frac{3}{4}$ is equivalent to $\frac{6}{8}$ and $\frac{9}{12}$.

Lesson 2-11

Think and Discuss

- terminating decimal; the decimal comes to an end.
- tenths
- thousandths = $\frac{36}{1,000}$
- Yes; $0.333 \dots$ is a repeating decimal and 0.3 is a terminating decimal.

Assignment Guide

If you finished **Example 1** assign:
Average 1-4, 14-21, 56-64
Advanced 14-21, 54, 56-64

If you finished **Example 2** assign:
Average 1-8, 14-25, 55-64
Advanced 14-25, 54, 55-64

If you finished **Example 3** assign:
Average 1-12, 14-33, 55-64
Advanced 14-33, 36-48, 54, 55-64

If you finished **Example 4** assign:
Average 1-34, 35-49 odd, 55-64
Advanced 14-34, 36-48, 51-64

Homework Quick Check

Quickly check key concepts.
 Exercises: 16, 20, 24, 26, 30, 34

= **WORKED-OUT SOLUTIONS**
 on p. WS4

Interactive Answers and Solutions

Math Background

Use these steps to find the fraction equivalent to a repeating decimal.

$$x = 3.\overline{5721}$$

Multiply each side by 10.

$$10x = 35.\overline{721}$$

Multiply each side by 1,000.

$$10,000x = 35,721.\overline{721}$$

Subtract the first equation from the second.

$$9,990x = 35,686$$

$$\text{so } x = \frac{35,686}{9,990}, \text{ or } \frac{17,843}{4,995}$$

Sunshine State Standards

Benchmark	Exercises
MA.7.A.5.1	1-8, 13-25, 34-56
MA.7.A.3.2	57-60
MA.7.A.3.3	61-64

GUIDED PRACTICE

See Example 1 Write each fraction as a decimal. Round to the nearest hundredth, if necessary.

1. $\frac{4}{7}$ **0.57** 2. $\frac{21}{8}$ **2.63** 3. $\frac{11}{6}$ **1.83** 4. $\frac{7}{9}$ **0.78**

See Example 2 Write each fraction as a decimal.

5. $\frac{3}{25}$ **0.12** 6. $\frac{5}{18}$ **0.27** 7. $\frac{9}{11}$ **0.81** 8. $\frac{3}{5}$ **0.6**

See Example 3 Write each decimal as a fraction in simplest form.

9. 0.008 $\frac{1}{125}$ 10. 0.6 $\frac{3}{5}$ 11. 2.05 $\frac{41}{20}$ or $2\frac{1}{20}$ 12. 3.75 $\frac{15}{4}$ or $3\frac{3}{4}$

See Example 4 **13. Sports** After sweeping the Baltimore Orioles at home in 2001, the Seattle Mariners had a record of 103 wins out of 143 games played. Find the Mariners' winning rate. Write your answer as a decimal rounded to the nearest thousandth. **0.720**

INDEPENDENT PRACTICE

See Example 1 Write each fraction as a decimal. Round to the nearest hundredth, if necessary.

14. $\frac{9}{10}$ **0.9** 15. $\frac{32}{5}$ **6.4** 16. $\frac{18}{25}$ **0.72** 17. $\frac{7}{8}$ **0.88**
 18. $\frac{16}{11}$ **1.45** 19. $\frac{500}{500}$ **1** 20. $\frac{17}{3}$ **5.67** 21. $\frac{23}{12}$ **1.92**

See Example 2 Write each fraction as a decimal.

22. $\frac{5}{4}$ **1.25** 23. $\frac{7}{9}$ **0.7** 24. $\frac{13}{3}$ **4.3** 25. $\frac{11}{20}$ **0.55**

See Example 3 Write each decimal as a fraction in simplest form.

26. 0.45 $\frac{9}{20}$ 27. 0.01 $\frac{1}{100}$ 28. 0.25 $\frac{1}{4}$ 29. 0.08 $\frac{2}{25}$
 30. 1.8 $\frac{9}{5}$ or $1\frac{4}{5}$ 31. 15.25 $\frac{61}{4}$ or $15\frac{1}{4}$ 32. 5.09 $\frac{509}{100}$ or $5\frac{9}{100}$ 33. 8.375 $\frac{67}{8}$ or $8\frac{3}{8}$

See Example 4 **34. School** On a test, Caleb answered 73 out of 86 questions correctly. What portion of his answers was correct? Write your answer as a decimal rounded to the nearest thousandth. **0.849**

PRACTICE AND PROBLEM SOLVING

Give two numbers equivalent to each fraction or decimal. Possible answers:

35. $8\frac{3}{4}$ **8.75, $8\frac{6}{8}$** 36. 0.66 $\frac{66}{100}, \frac{33}{50}$ 37. 5.05 $5\frac{1}{20}, 5\frac{5}{100}$ 38. $\frac{8}{25}$ **0.32, $\frac{16}{50}$**
41. 4.003, $\frac{4,003}{1,000}$ 39. 15.35 $15\frac{7}{20}, \frac{307}{20}$ 40. $8\frac{3}{8}$ **8.375, $\frac{67}{8}$** 41. $4\frac{3}{1,000}$ 42. $3\frac{1}{3}$ **$\frac{10}{3}, 3.\bar{3}$**

Determine whether the numbers in each pair are equivalent.

43. $\frac{3}{4}$ and 0.75 **yes** 44. $\frac{7}{20}$ and 0.45 **no** 45. $\frac{2}{3}$ and 0.67 **no** 46. 0.8 and $\frac{4}{5}$ **yes**
 47. 0.275 and $\frac{11}{40}$ **yes** 48. $1\frac{5}{6}$ and 1.83 **no** 49. 0.41 and $\frac{11}{27}$ **no** 50. 0.35 and $\frac{7}{20}$ **yes**

REVIEW FOR MASTERY 2-11

LESSON 2-11 Review for Mastery
Equivalent Fractions and Decimals

To write a fraction as a decimal, divide the numerator of the fraction by the denominator of the fraction.

Write $\frac{3}{7}$ as a decimal.

$$\begin{array}{r} 0.428 \\ 7 \overline{)3.000} \\ \underline{-2.8} \\ 20 \\ \underline{-14} \\ 60 \\ \underline{-56} \\ 4 \end{array}$$

• Divide 3 by 7.
 • To round your answer to the nearest hundredth, add 3 zeros after the decimal point in the divisor.
 0.428 rounded to the nearest hundredth is 0.43.

1. Write $\frac{2}{5}$ as a decimal. $\frac{2}{5}$ **0.4; 0.4**

$$\begin{array}{r} 0.4 \\ 5 \overline{)2.0} \\ \underline{-2.0} \\ 0 \end{array}$$

Write each fraction as a decimal. Round to the nearest hundredth, if necessary.

2. $\frac{3}{4}$ **0.75** 3. $\frac{7}{8}$ **0.88** 4. $\frac{3}{2}$ **1.5** 5. $\frac{5}{3}$ **1.67**

To write a decimal as a fraction:

Step 1: Use place value to read the decimal. Say the number aloud.
Step 2: Write a fraction for the number you just said.
Step 3: Simplify if necessary.

Write 0.005 as a fraction. Read 0.005 as "five thousandths." Write $\frac{5}{1,000}$ for five thousandths. Simplify: $\frac{5 \div 5}{1,000 \div 5} = \frac{1}{200}$

Write 1.6 as a fraction. Read 1.6 as "one and six tenths." Write $1\frac{6}{10}$ for one and six tenths. Simplify: $1\frac{6 \div 2}{10 \div 2} = 1\frac{3}{5}$

Write each decimal as a fraction or mixed number in simplest form.

6. 0.8 $\frac{4}{5}$ 7. 2.25 $2\frac{1}{4}$ 8. -0.02 $-\frac{1}{50}$

PRACTICE 2-11

LESSON 2-11 Practice B
Equivalent Fractions and Decimals

Write each fraction as a decimal. Round to the nearest hundredth, if necessary.

1. $\frac{5}{18}$ **0.278** 2. $\frac{19}{20}$ **0.95** 3. $\frac{5}{8}$ **0.625** 4. $\frac{11}{5}$ **2.2**
 5. $\frac{19}{6}$ **3.167** 6. $\frac{17}{4}$ **4.25** 7. $\frac{13}{12}$ **1.083** 8. $\frac{30}{7}$ **4.286**
 9. $\frac{7}{4}$ **1.75** 10. $\frac{8}{9}$ **0.889** 11. $\frac{3}{22}$ **0.136** 12. $\frac{2}{25}$ **0.08**

Write each decimal as a fraction in simplest form.

13. 0.85 $\frac{17}{20}$ 14. 0.11 $\frac{11}{100}$ 15. -0.25 $-\frac{1}{4}$
 16. 4.3 $4\frac{3}{10}$ 17. 7.75 $7\frac{3}{4}$ 18. 5.03 $5\frac{3}{100}$ or $\frac{503}{100}$
 19. -1.06 $-1\frac{3}{50}$ or $-\frac{53}{50}$ 20. 0.375 $\frac{3}{8}$ 21. -2.65 $-2\frac{13}{20}$ or $-\frac{53}{20}$
 22. -5.6 $-5\frac{3}{5}$ or $-\frac{28}{5}$ 23. 1.12 $1\frac{3}{25}$ or $\frac{28}{25}$ 24. 0.005 $\frac{1}{200}$

Write each answer as a decimal rounded to the nearest thousandth.

25. In the 1998 Winter Olympics, a total of 205 medals were awarded. The United States won 13 medals. What portion of the medals did the United States win?
0.063

26. On a test, Hailey answered 64 out of 75 question correctly. What portion of her answers was correct?
0.853



Use the table for Exercises 51 and 52.

XYZ Stock Values (October 2006)				
Date	Open	High	Low	Close
Oct 16	17.89	18.05	17.5	17.8
Oct 17	18.01	18.04	17.15	17.95
Oct 18	17.84	18.55	17.81	18.20



Traders watch the stock prices change from the floor of a stock exchange.



Before the days of computer technology, ticker-tape machines were used to punch the stock prices onto paper strands.

51. Write the highest value of stock XYZ for each day as a mixed number in simplest form.
52. On which date did the price of stock XYZ change by $\frac{9}{25}$ of a dollar between the open and close of the day? **October 18**
53. **Write About It** Until recently, prices of stocks were expressed as mixed numbers, such as $24\frac{15}{32}$ dollars. The denominators of such fractions were multiples of 2, such as 2, 4, 6, 8, and so forth. Today, the prices are expressed as decimals to the nearest hundredth, such as 32.35 dollars.
- What are some advantages of using decimals instead of fractions?
 - The old ticker-tape machine punched stock prices onto a tape. Perhaps because fractions could not be shown using the machine, the prices were punched as decimals. Write some decimal equivalents of fractions that the machine might print.
54. **Challenge** Write $\frac{1}{9}$ and $\frac{2}{9}$ as decimals. Use the results to predict the decimal equivalent of $\frac{8}{9}$. **0.1, 0.2, 0.8**

Ongoing Assessment

and **INTERVENTION**

Diagnose Before the Lesson
2-11 Warm Up, TE p. 106

Monitor During the Lesson
2-11 Learn It, *Worktext* pp. 83–85
2-11 Summarize It, *Worktext* p. 86

Assess After the Lesson
2-11 Lesson Quiz, TE p. 109

Interdisciplinary



Economics

Exercises 51–53 involve comparing stock prices. The information includes some history about the fractions used in stock values and their decimal equivalents on the ticker tape.

Answers

51. $18\frac{1}{20}$, $18\frac{1}{25}$, $18\frac{11}{20}$
53. See p. A1.

Florida Spiral Review

MA.7.A.5.1, MA.7.A.3.3

55. **Multiple Choice** Which is equivalent to $\frac{5}{6}$?
A. 0.83 B. 0.833 **C. $0.8\bar{3}$** D. $0.8\bar{3}$
56. **Gridded Response** What is $\frac{7}{16}$ written as a decimal? **0.4375**
- Find each quotient. (Lesson 2-4)
57. $51 \div (-3)$ **-17** 58. $-121 \div 11$ **-11** 59. $-91 \div (-7)$ **13** 60. $-57 \div 0$ **undef.**
- Solve the equation. (Lesson 2-6)
61. $3x - 5 = 1$ **2** 62. $5x + 4 = 19$ **3** 63. $36 + 9x = 162$ **14** 64. $-9 = -9x - 9$
 $x = 0$



In Exercise 55, students must be careful to distinguish between the two different repeating decimals in choices **C** and **D**. You may suggest they write out the numbers $0.8\bar{3}$ and $0.838383\dots$, respectively, to help them select the correct answer.



Journal

Ask students to write a paragraph comparing and contrasting terminating and repeating decimals. Have them include specific examples.

CHALLENGE 2-11

LESSON 2-11 Challenge
Decimal Patterns

Repeating decimals continue without end with a repeating pattern. Some decimals continue without end, but do not have a repeating pattern. These decimals are called *nonrepeating, nonterminating* decimals. Although they continue without end, these decimals may have a pattern.

Examples of nonrepeating, nonterminating decimals with patterns:
5.121121112...
0.881882883...

Write r if the decimal is a repeating decimal and n if the decimal is a nonrepeating, nonterminating decimal.

1. 4.562222...	2. 6.132332332...	3. 8.355355...	4. 0.230230023...
r	n	r	n

5. 10.7727227...	6. 4.121314...	7. 0.42818181...	8. 29.7053053...
n	n	r	r

9. 1.221221222...	10. 5.67167672...	11. 75.320333...	12. 4.121231234...
n	n	r	n

Identify the pattern in each nonrepeating, nonterminating decimal. Use the pattern to extend the decimal several places.

13. 0.010203...	14. 8.636336333...
0.01020304...	8.63633633363333...

15. 25.121231234...	16. 9.989796...
25.12123123412345...	9.98979695...

17. Write an example of a repeating decimal.
Possible answer: 1.2222...

18. Write an example of a nonrepeating, nonterminating decimal with a pattern.
Possible answer: 1.191991999...

PROBLEM SOLVING 2-11

LESSON 2-11 Problem Solving
Equivalent Fractions and Decimals

Write the correct answer.

- On a test, Shane answered 37 out of 40 questions correctly. What portion of his answers was correct? Write your answer as a decimal rounded to the nearest thousandth.
0.925
- Ken Griffey, Jr. hit 35 home runs in 2005. He had 491 at bats. Write his home run average as a decimal rounded to the nearest thousandth.
0.071
- In February, Chicago receives an average of $1\frac{2}{5}$ inches of rain. Write a decimal to show the number of inches of rain.
1.4 in.
- On a test, Ellen answered 51 out of 64 questions correctly. What portion of her answers was correct? Write your answer as a decimal rounded to the nearest thousandth.
0.797

Choose the letter for the best answer. Use the graph for 5–6.

5. Which mixed number shows the energy, in quadrillions of BTU, consumed in Eastern Europe in 2003?
A 53 C $53\frac{1}{2}$
B $53\frac{1}{4}$ D $53\frac{4}{5}$

6. Which mixed number shows the energy, in quadrillions of BTU, consumed in the Middle East in 2003?
F $19\frac{1}{10}$ H $19\frac{3}{5}$
G $19\frac{2}{5}$ I $19\frac{3}{10}$

7. Jill sold 478 out of 520 tickets to the opening night of her theater performance. What portion of the tickets did she sell?
A 0.998 C 0.919
B 1.088 D 0.081

8. The high school sold 369 out of 460 tickets to the opening night of a concert series. What portion of the tickets was sold?
F 0.198 H 1.247
G 0.829 I 0.802

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2-11 Lesson Quiz

Write each fraction as a decimal.

1. $\frac{16}{5}$ **3.2** 2. $\frac{21}{8}$ **2.625**
3. $\frac{7}{10}$ **0.7** 4. $\frac{11}{20}$ **0.55**

Write each decimal as a fraction in simplest form.

5. 0.42 **$\frac{21}{50}$** 6. 8.625 **$\frac{69}{8}$ or $8\frac{5}{8}$**

7. If your soccer team wins 21 out of 30 games, what is your team's winning rate? **0.70**

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