

**Chapter  
2****Fair Game Review**

Simplify the expression. Explain each step.

1.  $2 + (5 + 18)$

2.  $(22 + 1) + 9$

3.  $(37 + 5) + 3$

4.  $25 \times (4 \times 6)$

5.  $(22 \times 5) \times 2$

6.  $(17 \times 2) \times 50$

Name \_\_\_\_\_ Date \_\_\_\_\_

**Chapter**  
**2**

**Fair Game Review** (continued)

7.  $17 \bullet 6 \bullet 0$

8.  $5 \bullet 0 \bullet 4$

9.  $7 \bullet 2 \bullet 1$

10.  $1 \bullet 5 \bullet 4$

11.  $(14 + 3) + 0$

12.  $0 + (12 + 4)$

**2.1****Adding Integers**

For use with Activity 2.1

**Essential Question** Is the sum of two integers *positive*, *negative*, or *zero*? How can you tell?

**1 ACTIVITY:** Adding Integers with the Same Sign

Work with a partner. Draw a picture to show how you use integer counters to find  $-4 + (-3)$ .

$$-4 + (-3) = \underline{\hspace{2cm}}$$

**2 ACTIVITY:** Adding Integers with Different Signs

Work with a partner. Draw a picture to show how you use integer counters to find  $-3 + 2$ .

$$-3 + 2 = \underline{\hspace{2cm}}$$

**3 ACTIVITY:** Adding Integers with Different Signs

Work with a partner. Show how to use a number line to find  $5 + (-3)$ .

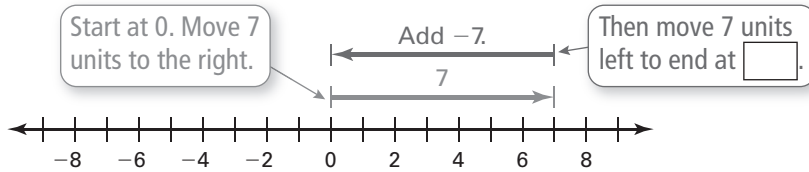


$$5 + (-3) = \underline{\hspace{2cm}}$$

**2.1 Adding Integers (continued)**

**4 ACTIVITY: Adding Integers with Different Signs**

Work with a partner. Write the addition expression shown. Then find the sum. How are the integers in the expression related to 0 on a number line?



**Inductive Reasoning**

Work with a partner. Use integer counters or a number line to complete the table.

	Exercise	Type of Sum	Sum	Sum: Positive, Negative, or Zero
<b>1</b>	5. $-4 + (-3)$			
<b>2</b>	6. $-3 + 2$			
<b>3</b>	7. $5 + (-3)$			
<b>4</b>	8. $7 + (-7)$			
	9. $2 + 4$			
	10. $-6 + (-2)$			
	11. $-5 + 9$			
	12. $15 + (-9)$			
	13. $-10 + 10$			
	14. $-6 + (-6)$			
	15. $13 + (-13)$			

**2.1** Adding Integers (continued)

**What Is Your Answer?**

**16. IN YOUR OWN WORDS** Is the sum of two integers *positive*, *negative*, or *zero*? How can you tell?

**17. STRUCTURE** Write a general rule for adding

a. two integers with the same sign.

b. two integers with different signs.

c. two integers that vary in sign.

## 2.1 Practice

Add.

1.  $8 + 2$                       2.  $-5 + (-3)$                       3.  $-9 + (-3)$                       4.  $6 + (-6)$   
 5.  $4 + (-4)$                       6.  $9 + (-6)$                       7.  $5 + (-2)$                       8.  $7 + (-13)$   
 9.  $-18 + 1$                       10.  $-12 + (-5)$                       11.  $0 + (-7)$                       12.  $12 + (-15)$

13. Your bank account has a balance of  $-\$21$ . You deposit  $\$50$ . What is your new balance?

Tell how the Commutative and Associative Properties of Addition can help you find the sum mentally. Then find the sum.

14.  $8 + (-5) + (-8)$                       15.  $-4 + 9 + 4$                       16.  $-5 + 12 + (-7)$

Add.

17.  $7 + 5 + (-2)$                       18.  $-13 + 7 + (-3)$                       19.  $17 + (-5) + (-1)$   
 20.  $4 + 8 + (-8)$                       21.  $-12 + (-4) + 9$                       22.  $-10 + 10 + (-3)$   
 23.  $(-11) + 5 + (-12)$                       24.  $7 + 15 + (-7)$                       25.  $-12 + (-5) + (-10)$

Use mental math to solve the equation.

26.  $n + (-8) = 5$                       27.  $4 + c = 0$                       28.  $-6 + k = -14$

29. In golf, a golfer must have a score of 0 in order to be at par. A golfer scores 2 above par on the first hole, 1 below par on the second hole, and 2 below par on the third hole. Which expression can be used to decide whether the golfer is at par after the first three holes?

$$\boxed{(-2) + 1 + 2}$$

$$\boxed{2 + (-1) + 2}$$

$$\boxed{2 + (-1) + (-2)}$$

30. Copy and complete the magic square so that each row and column has a magic sum of 0. Use each integer from  $-4$  to  $4$  exactly once.

3		-2
		2

**2.2****Subtracting Integers**

For use with Activity 2.2

**Essential Question** How are adding integers and subtracting integers related?

**1 ACTIVITY: Subtracting Integers**

Work with a partner. Draw a picture to show how you use integer counters to find  $4 - 2$ .

$$4 - 2 = \underline{\hspace{2cm}}$$

**2 ACTIVITY: Adding Integers**

Work with a partner. Draw a picture to show how you use integer counters to find  $4 + (-2)$ .

$$4 + (-2) = \underline{\hspace{2cm}}$$

**3 ACTIVITY: Subtracting Integers**

Work with a partner. Show how to use a number line to find  $-3 - 1$ .

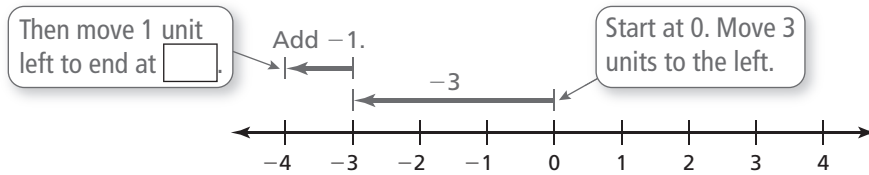


$$-3 - 1 = \underline{\hspace{2cm}}$$

**2.2 Subtracting Integers (continued)**

**4 ACTIVITY: Adding Integers**

Work with a partner. Write the addition expression shown. Then find the sum.



**Inductive Reasoning**

Work with a partner. Use integer counters or a number line to complete the table.

	Exercise	Operation: Add or Subtract	Answer
<b>1</b>	5. $4 - 2$		
<b>2</b>	6. $4 + (-2)$		
<b>3</b>	7. $-3 - 1$		
<b>4</b>	8. $-3 + (-1)$		
	9. $3 - 8$		
	10. $3 + (-8)$		
	11. $9 - 13$		
	12. $9 + (-13)$		
	13. $-6 - (-3)$		
	14. $-6 + 3$		
	15. $-5 - (-12)$		
	16. $-5 + 12$		

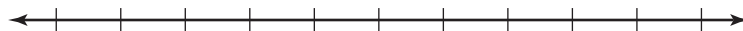


**2.2 Subtracting Integers (continued)****What Is Your Answer?**

**17. IN YOUR OWN WORDS** How are adding integers and subtracting integers related?

**18. STRUCTURE** Write a general rule for subtracting integers.

**19.** Use a number line to find the value of the expression  $-4 + 4 - 9$ .  
What property can you use to make your calculation easier? Explain.



## 2.2 Practice

### Subtract.

1.  $3 - 8$
  2.  $4 - (-5)$
  3.  $-6 - 4$
  4.  $-9 - (-6)$
  5.  $10 - (-9)$
  6.  $12 - 4$
  7.  $-15 - 7$
  8.  $-6 - (-14)$
  9.  $-1 - (-3)$
  10.  $15 - (-7)$
  11.  $20 - (-10)$
  12.  $-31 - 14$
13. You are scuba diving at  $-8$  feet. You dive 5 feet deeper. What is your position in the water?
14. Write  $7 - 3$  using addition.
15. Write  $5 + (-3)$  using subtraction.

### Evaluate the expression.

16.  $8 - 12 - (-6)$
17.  $8 - (-8) - 3$
18.  $0 - (-4) - 8$
19.  $9 - (-4) + 1$
20.  $7 - 12 - (-4)$
21.  $-11 - (-8) - (-3)$
22.  $-14 - 6 - (-2)$
23.  $8 + 0 - (-11)$
24.  $8 + 13 - (-5)$

### Use mental math to solve the equation.

25.  $a - 7 = 3$
  26.  $b - (-8) = -3$
  27.  $6 - c = 10$
28. Write two different pairs of negative integers,  $x$  and  $y$ , that make the statement  $x - y = 2$  true.

29. The table shows the highest and lowest elevations for two cities.

City	Highest elevation (feet)	Lowest elevation (feet)
Long Beach, CA	360	$-7$
New Orleans, LA	25	$-8$

- a. Find the range of elevations for Long Beach.
- b. Find the range of elevations for New Orleans.
- c. One of the cities has an average elevation of about 2 feet below sea level. Which city is it?

# 2.3

## Multiplying and Dividing Integers

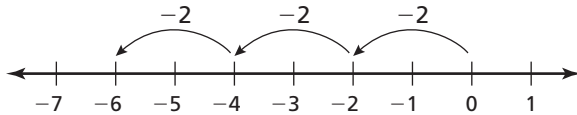
For use with Activity 2.3

**Essential Question** How can you multiply and divide integers?

### 1 ACTIVITY: Multiplying Integers with Different Signs

Work with a partner. Use repeated addition to find  $3 \cdot (-2)$ .

$3 \cdot (-2)$  means to add 3 groups of  $-2$ .



Now you can write

$$3 \cdot (-2) = \underline{\quad} + \underline{\quad} + \underline{\quad}$$

$$= \underline{\quad}.$$

So,  $3 \cdot (-2) = \underline{\quad}$ .

### 2 ACTIVITY: Multiplying Integers with the Same Sign

Work with a partner. Use a table to find  $-3 \cdot (-2)$ .

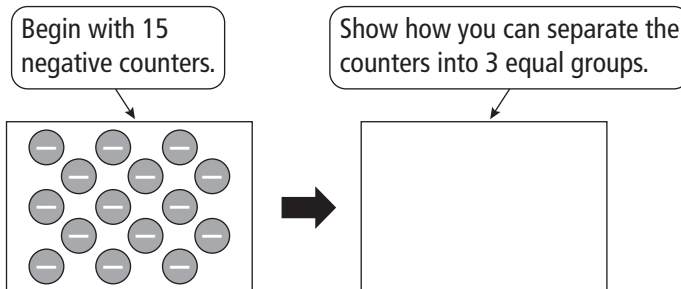
Describe the pattern of the products in the table. Then complete the table.

-3	•	3	=	-9
-3	•	2	=	-6
-3	•	1	=	-3
-3	•	0	=	
-3	•	-1	=	
-3	•	-2	=	

So,  $-3 \cdot (-2) = \underline{\quad}$ .

### 3 ACTIVITY: Dividing Integers Using Manipulatives

Work with a partner. Use integer counters to find  $-15 \div 3$ .



Because there are  $\underline{\quad}$  negative counters in each group,  $-15 \div 3 = \underline{\quad}$ .

**2.3** Multiplying and Dividing Integers (continued)**4** **ACTIVITY:** Rewriting a Product as a Quotient

Work with a partner. Rewrite the product  $3 \cdot (-4) = -12$  as a quotient in two different ways.

*First Way*

$$-12 \div (\quad) = \quad$$

*Second Way*

$$-12 \div (\quad) = \quad$$

When you divide a \_\_\_\_\_ integer by a \_\_\_\_\_ integer, you get a \_\_\_\_\_ integer. When you divide a \_\_\_\_\_ integer by a \_\_\_\_\_ integer, you get a \_\_\_\_\_ integer.

**Inductive Reasoning**

Work with a partner. Complete the table.

Exercise	Type of Product or Quotient	Product or Quotient	Product or Quotient: Positive, Negative, or Zero
5. $6 \cdot 3$	Integers with the same sign		
6. $2 \cdot (-5)$			
7. $-6 \cdot 5$			
8. $-5 \cdot (-3)$			
9. $0 \cdot (-5)$			
10. $-6 \div 2$			
11. $-21 \div (-7)$			
12. $10 \div (-2)$			
13. $12 \div (-6)$			
14. $0 \div (-15)$			

**2.3** Multiplying and Dividing Integers (continued)**What Is Your Answer?**

**15. IN YOUR OWN WORDS** Is the product (or quotient) of two integers *positive, negative, or zero*? How can you tell?

**16. STRUCTURE** Write general rules for multiplying and dividing

a. two integers with the same sign.

b. two integers with different signs.

**2.3 Practice****Solve. Multiply or divide.**

1.  $4 \cdot (-3)$

2.  $-6 \cdot 5$

3.  $-8(-2)$

4.  $9 \cdot 6$

5.  $0 \cdot (-7)$

6.  $-12(-3)$

7.  $8 \div (-4)$

8.  $-15 \div (-3)$

9.  $\frac{-10}{5}$

10.  $0 \div (-7)$

11.  $-35 \div 7$

12.  $\frac{18}{-6}$

13. A water tank leaks 5 gallons of water each day. What integer represents the change in the number of gallons of water in the tank after 7 days?

**Multiply.**

14.  $2 \cdot (-3) \cdot 5$

15.  $-5(-4)(-1)$

16.  $7 \cdot 2 \cdot (-3)$

**Find the mean of the integers.**

17. 5, -17, 12, -10, 15

18. -16, -27, 21, -19, 14, -3

**Find the next two numbers in the pattern.**

19. 6, -12, 24, -48, ...

20. 9, -27, 81, -243, ...

21. An elevator is 180 feet above the first floor. Each second it descends 12 feet.

a. What integer is the change in the height of the elevator each second?

b. Copy and complete the table.

<b>Time</b>	3 sec	6 sec	9 sec
<b>Height</b>			

c. Estimate how many seconds it takes the elevator to get to the first floor. Explain your reasoning.

d. From the first floor, it takes 4 seconds to reach the basement floor. What is the height of the basement floor with respect to the first floor?

**2.4**

**Powers and Exponents**

For use with Activity 2.4


**Essential Question** How can you use repeated factors in real-life situations?

*As I was going to St. Ives  
 I met a man with seven wives  
 Each wife had seven sacks  
 Each sack had seven cats  
 Each cat had seven kits  
 Kits, cats, sacks, wives  
 How many were going to St. Ives?*

Nursery Rhyme, 1730

**1 ACTIVITY:** Analyzing a Math Poem

**Work with a partner. Here is a “St. Ives” poem written by two students. Answer the question in the poem.**



As I was walking into town  
 I met a ringmaster with five clowns  
 Each clown had five magicians  
 Each magician had five bunnies  
 Each bunny had five fleas  
 Fleas, bunnies, magicians, clowns  
 How many were going into town?

Number of clowns:            5            = \_\_\_\_\_

Number of magicians:       5 × 5       = \_\_\_\_\_

Number of bunnies:        5 × 5 × 5   = \_\_\_\_\_

Number of fleas:            5 × 5 × 5 × 5 = \_\_\_\_\_

So, the number of fleas, bunnies, magicians, and clowns is \_\_\_\_\_.

**2.4 Powers and Exponents (continued)****2 ACTIVITY:** Writing Repeated Factors

Work with a partner. Complete the table.

Repeated Factors	Using an Exponent	Value
a. $4 \times 4$		
b. $6 \times 6$		
c. $10 \times 10 \times 10$		
d. $100 \times 100 \times 100$		
e. $3 \times 3 \times 3 \times 3$		
f. $4 \times 4 \times 4 \times 4 \times 4$		
g. $2 \times 2 \times 2 \times 2 \times 2 \times 2$		

- h. In your own words, describe what the two numbers in the expression  $3^5$  mean.





## 2.4 Practice

Write the product as a power.

1.  $6 \times 6$
2.  $8 \times 8 \times 8$
3.  $3 \times 3 \times 3 \times 3$
4.  $12 \bullet 12$
5.  $4 \times 4 \times 4 \times 4$
6.  $10 \bullet 10 \bullet 10 \bullet 10 \bullet 10$
7. Describe and correct the error in writing the value of the product.
 

$\times$	$2 \times 2 \times 2 \times 2 = 4^2$
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Find the value of the power.

8.  $9^2$
9.  $3^0$
10.  $7^3$
11. The amount of money in your savings account is  $4 \times 10^3$ . How much money is in your account?

Determine whether the number is a perfect square.

12. 9
13. 12
14. 50
15. 64
16. 100
17. 34
18. Write two perfect squares that each have a value greater than 100 and less than 200.
19. Copy and complete the table. Then describe how to write any power of 1 without multiplying.

<b>Power</b>	$1^1$	$1^2$	$1^3$	$1^4$	$1^5$
<b>Value</b>	1	1			

20. The following items are in the shape of a square. How many squares are in each row?
  - a. A waffle has 16 squares.
  - b. A magic square has 49 squares.
  - c. A tile game has 100 squares.
21. Bob has three pennies. Betty has three times as many pennies as Bob. Bill has three times as many pennies as Betty. Barb has three times as many pennies as Bill. Write a power to represent the number of pennies that Barb has.

**2.5****Order of Operations**

For use with Activity 2.5

**Essential Question** What is the effect of inserting parentheses into a numerical expression?

**1 ACTIVITY:** Comparing Different Orders

**Work with a partner. Find the value of the expression by using different orders of operations. Are your answers the same? (Circle *yes* or *no*.)**

- |                                    |                             |        |
|------------------------------------|-----------------------------|--------|
| <b>a.</b> Add, then multiply.      | Multiply, then add.         | Same?  |
| $3 + 4 \times 2 =$ _____           | $3 + 4 \times 2 =$ _____    | Yes No |
| <b>b.</b> Add, then subtract.      | Subtract, then add.         | Same?  |
| $5 + 3 - 1 =$ _____                | $5 + 3 - 1 =$ _____         | Yes No |
| <b>c.</b> Divide, then multiply.   | Multiply, then divide.      | Same?  |
| $12 \div 3 \cdot 2 =$ _____        | $12 \div 3 \cdot 2 =$ _____ | Yes No |
| <b>d.</b> Divide, then add.        | Add, then divide.           | Same?  |
| $16 \div 4 + 4 =$ _____            | $16 \div 4 + 4 =$ _____     | Yes No |
| <b>e.</b> Multiply, then subtract. | Subtract, then multiply.    | Same?  |
| $8 \times 4 - 2 =$ _____           | $8 \times 4 - 2 =$ _____    | Yes No |
| <b>f.</b> Multiply, then divide.   | Divide, then multiply.      | Same?  |
| $8 \cdot 4 \div 2 =$ _____         | $8 \cdot 4 \div 2 =$ _____  | Yes No |

**2.5** Order of Operations (continued)

<b>g.</b> Subtract, then add.	Add, then subtract.	Same?
$13 - 4 + 6 =$ _____	$13 - 4 + 6 =$ _____	Yes    No

<b>h.</b> Multiply, then add.	Add, then multiply.	Same?
$1 \times 2 + 3 =$ _____	$1 \times 2 + 3 =$ _____	Yes    No

**2** **ACTIVITY:** Using Parentheses

**Work with a partner. Use all the symbols and numbers to write an expression that has the given value.**

<i>Symbols and Numbers</i>	<i>Value</i>	<i>Expression</i>
<b>a.</b> ( ), +, ÷, 3, 4, 5	3	_____
<b>b.</b> ( ), -, ×, 2, 5, 8	11	_____
<b>c.</b> ( ), ×, ÷, 4, 4, 16	16	_____
<b>d.</b> ( ), -, ÷, 3, 8, 11	1	_____
<b>e.</b> ( ), +, ×, 2, 5, 10	70	_____

**2.5** Order of Operations (continued)**3** **ACTIVITY:** Reviewing Fractions and Decimals

Work with a partner. Evaluate the expression.

a.  $\frac{3}{4} - \left(\frac{1}{4} + \frac{1}{2}\right)$

b.  $\left(\frac{5}{6} - \frac{1}{6}\right) - \frac{1}{12}$

c.  $7.4 - (3.5 - 3.1)$

d.  $10.4 - (8.6 + 0.9)$

e.  $(\$7.23 + \$2.32) - \$5.40$

f.  $\$124.60 - (\$72.41 + \$5.67)$

**What Is Your Answer?**

4. In an expression with two or more operations, why is it necessary to agree on an order of operations? Give examples to support your explanation.

5. **IN YOUR OWN WORDS** What is the effect of inserting parentheses into a numerical expression?

## 2.5 Practice

Find the value of the expression.

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

2.  $16 - (4 \times 3)$

3.  $27 \div (3 + 6)$

Evaluate the expression.

4.  $15 - 4 \times 3$

5.  $5 + (1 - 3)^3$

6.  $7 + 4 \times 2^3$

7.  $6^2 \div 6 \times (-2)$

8.  $4 + 6^2 \div 12$

9.  $13 - (28 - 4^2)$

10. Describe and correct the error in evaluating the expression.

$\times$	$56 \div 4 \times 2 = 56 \div 8 = 7$
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11. For a math project, you need to complete 4 math worksheets in 5 days. Each worksheet contains 15 problems. Evaluate the expression  $4 \times 15 \div 5$  to find how many problems you need to complete each day.

Evaluate the expression.

12.  $(49 - 5^2) \div 2^3$

13.  $7^2 - 5(10 - 3^2)$

14.  $\left(\frac{5}{2} - \frac{3}{2}\right)^3 \times 16$

15.  $18 - 5(4.7 - 1.7)$

16.  $7 \times |-6 + 9|$

17.  $15 - |3(-6)|$

18. You have 8 dimes and 13 nickels. How many cents do you have?

19. Use all four operations without parentheses to write an expression that has a value of 1.

20. A family buys 3 dinners at \$9 each, 2 kid's meals at \$4 each, and 4 desserts at \$3 each. After using a \$10 off coupon, how much do they owe before sales tax? Explain how you solved the problem.

21. Four family members are going on an airplane trip together. They are parking a car at the airport terminal. The daily parking rate is \$17 per car. The car will be parked for 6 days and they share the cost. What is the total cost per family member? Explain how you solved the problem.