## LESSON 3-1 Ready to Go On? Problem Solving Intervention
### *Ordered Pairs*

When you use an equation to solve a problem, you can often use ordered pairs to show the solution.

The first story of a new skyscraper will be 25 feet high. Each of the other stories will be 12 feet high. The tower at the top will be 25 feet tall. If the building can be no taller than 800 feet, how many stories can there be?

**Understand the Problem**

**1.** What are the requirements for the skyscraper?

The first story and tower are each 25 feet high. Other stories are 12 feet. Total height must be 800 ft or less.

**Make a Plan**

**2.** If you write an equation relating all the given information, what variables will you use and what will they stand for?

Possible: *h* stands for the height in feet of the skyscraper and *n* for the number of stories above the first.

**3.** What value will you set *h* equal to? 800

**Solve**

**4.** Using *n* to stand for the number of stories above the first, write an expression for the height of all the stories above the first. 12*n*

**5.** Write an equation relating *h,* the maximum height in feet of the skyscraper, to the height of the three sections you listed in question 1.

$h = 25 + 12n + 25$

**6.** Solve the equation if $h = 800$, the maximum height allowed.

$n = 62.5$

**Check**

**7.** If *n* is 62.5, how many stories can there be? Explain.

62 stories; Possible explanation: You can't have half of a story, so you round down the quotient.

**8.** Solve the equation for $n = 62$ and show the solution as an ordered pair. $25 + 12(62) + 25 = 794$; (62, 794)

Copyright © by Holt, Rinehart and Winston. All rights reserved.


## LESSON 3-2 Ready to Go On? Skills Intervention
### *Graphing on a Coordinate Plane*

A **coordinate plane** contains a horizontal number line called the ***x*-axis** and a vertical number line called the ***y*-axis.** The axes divide the coordinate plane into four **quadrants.** The point where the two axes intersect is the **origin.** The ***x*-coordinate** indicates movement left or right, and the ***y*-coordinate** indicates movement up or down.

**Vocabulary**
coordinate plane
*x*-axis
*y*-axis
quadrant
origin
*x*-coordinate
*y*-coordinate

**Finding the Coordinates and Quadrants of Points on a Plane**
Give the coordinates of each point.

**A.** point *E*

Is the point left or right of the origin? right

How many spaces? 3

Is the *x*-coordinate positive or negative? positive

Is the point above or below the origin? above

How many spaces? 2

Is the *y*-coordinate positive or negative? positive

What are the coordinates of point *E*? (3, 2) What quadrant is it in? I

**B.** point *F* The point is left of the origin 2 spaces. The sign is negative.

The point is how many units below the origin? 4

What are the coordinates of the point? (−2, −4) What quadrant is it in? III

**Graphing an Equation**
Complete the table of ordered pairs.
Graph the equation on a coordinate plane.
$y = 2x + 5$

| *x* | $2x + 5$ | *y* | (*x*, *y*) |
|---|---|---|---|
| 0 | 2(0) + 5 | 5 | (0, 5) |
| 1 | 2(1) + 5 | 7 | (1, 7) |
| 2 | 2(2) + 5 | 9 | (2, 9) |
| 3 | 2(3) + 5 | 11 | (3, 11) |

Plot the points on the coordinate plane.
The first point is (0, 5). Look at the 0 first. What does this tell you?

The point will be on the *y*-axis, it does not move left or right.

Now look at the 5. Does this tell you to move up or down? up

Plot the remaining points and connect them with a straight line.

Copyright © by Holt, Rinehart and Winston. All rights reserved.


## LESSON 3-3 Ready to Go On? Skills Intervention
### *Interpreting Graphs and Tables*

**Matching Situations to Tables**
Marcy, Susie, and Brian all work at a package delivery company. The table below shows how many packages each person handled in four days at work. Tell which person corresponds to each situation described below.

| Day | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Person 1 | 100 | 140 | 0 | 100 |
| Person 2 | 150 | 130 | 150 | 0 |
| Person 3 | 80 | 85 | 100 | 90 |

**A.** Brian had a busier second day than his first day and called in sick on the third day.
Who had an increase from Day 1 to Day 2?
Person 1 and Person 3
How many packages would be handled by someone on a day they called in sick? 0
According to the table, which person probably called in sick on Day 3? Person 1
Brian corresponds to which person on the table? Person 1

**B.** Marcy is new on the job. She handles fewer packages than her coworkers on Days 1 and 2.
Which person shows the lowest number of packages on Days 1 and 2? Person 3
Marcy corresponds to which person on the table? Person 3

**C.** Susie is the busiest employee on the first day. She had a slight decrease in package numbers for the second day and took a vacation day on Day 4.
Which person is the busiest on Day 1? Person 2
How many packages would be handled by someone on vacation?
0
Which person handled this number on Day 4?
Person 2
Susie corresponds to which person on the table? Person 2

Copyright © by Holt, Rinehart and Winston. All rights reserved.


## SECTION 3A Ready to Go On? Quiz

### 3-1 Ordered Pairs
**Determine whether each ordered pair is a solution of $y = 3x - 4$.**

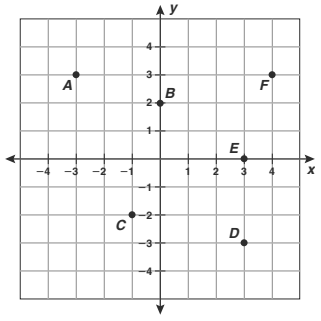
**1.** (12, 32) yes
**2.** (−4, 8) no
**3.** (1.4, 0.2) yes
**4.** (1.5, 1.5) no

**Acme Auto Rental charges $22.50 per day plus $0.15 per mile to rent a compact car. The equation for the total cost *c* of the car, including mileage and gas, is $c = 22.5 + 0.15m$, where *m* is the number of miles driven. Calculate the total cost to rent the car for each of the number of miles driven.**

**5.** $m = 80$ miles $34.50
**6.** $m = 300$ miles $67.50
**7.** $m = 240$ miles $58.50
**8.** $m = 148$ miles $44.70

**9.** The Total Design T-Shirt Company has a one-time charge of $32.00 for a design and an additional $3.00 to print the design on each t-shirt. Let *t* represent the number of t-shirts and *c* represent the total cost. Write an equation that can be used to find the total cost to pick a design and have it printed on *t* t-shirts. $c = 32 + 3t$

### 3-2 Graphing on a Coordinate Plane
**Give the coordinates and quadrant number of each point.**




**10.** *A* (−3, −3), II
**11.** *B* (0, 2), none
**12.** *C* (−1, −2), III
**13.** *D* (3, −3), IV
**14.** *E* (3, 0), none
**15.** *F* (4, 3), I

Copyright © by Holt, Rinehart and Winston. All rights reserved.

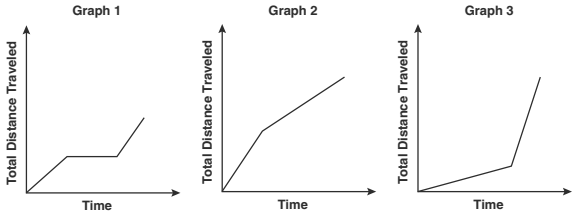

Copyright © by Holt, Rinehart and Winston. All rights reserved.

SECTION 3A

## Ready to Go On? Quiz continued

### 3-3 Interpreting Graphs and Tables

**Tell which graph corresponds to each situation below.**

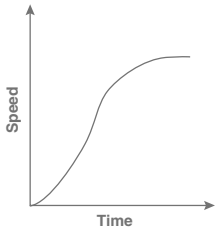



**11.** Rosita walks from her home to town and then rides with a friend in her car to the other side of town. — Graph 3

**12.** Reynaldo rides his bicycle from his home to the beginning of a path where he leaves his bike and takes a walking trip on along a river. — Graph 2

**13.** Simon rides his bicycle to the market where he stops to buy some snacks. He then continues on his bicycle at the same pace to his grandmother's house. — Graph 1

**14.** Create a graph that would most likely represent the speed of an airplane as it taxis down the runway, takes off and reaches its cruising altitude.



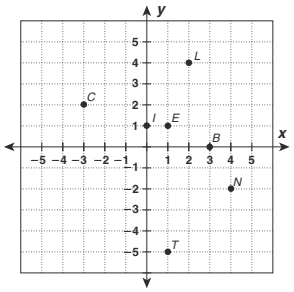

Copyright © by Holt, Rinehart and Winston. All rights reserved.


SECTION 3A

## Ready to Go On? Enrichment

### *Coordinate Plane Puzzles*

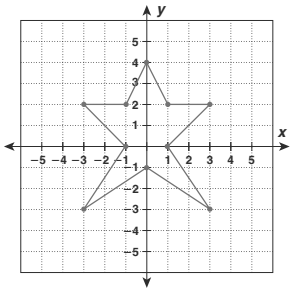
Fill in the letter that names each point for the given coordinates to complete the riddle.




**What did the zero say to the eight?**

| N | I | C | E | | B | E | L | T |
|---|---|---|---|---|---|---|---|---|
| (4, −2) | (0, 1) | (−3, 2) | (1, 1) | | (3, 0) | (1, 1) | (2, 4) | (1, −5) |

Plot the points below. Then, connect them in the order they are listed and name the shape you form.




**1.** (0, 4)
**2.** (1, 2)
**3.** (3, 2)
**4.** (1, 0)
**5.** (3, −3)
**6.** (0, −1)
**7.** (−3, −3)
**8.** (−1, 0)
**9.** (−3, 2)
**10.** (−1, 2)

star

Copyright © by Holt, Rinehart and Winston. All rights reserved.


LESSON 3-4

## Ready to Go On? Skills Intervention

### *Functions*

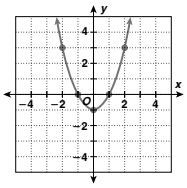
A **function** is a rule that relates two quantities so that only one **input** or *x*-value gives only one **output** or *y*-value. The **domain** of a function is all its possible input values and its **range** is all its possible output value.

**Vocabulary**
function
input
output
domain
range

**Finding Different Representations of a Function**
Make a table and graph of $y = x^2 - 1$.

Complete the table and then plot each point.

| *x* | $x^2 - 1$ | *y* | (*x*, *y*) |
|---|---|---|---|
| −2 | $(-2)^2 - 1$ | 3 | (−2, 3) |
| −1 | $(\underline{-1})^2 - 1$ | 0 | (−1, 0) |
| 0 | $(\underline{0})^2 - 1$ | −1 | (0, −1) |
| 1 | $(\underline{1})^2 - 1$ | 0 | (1, 0) |
| 2 | $(\underline{2})^2 - 1$ | 3 | (2, 3) |




Connect the points with a smooth curve.

Does each input value have one output value? yes

**Identifying Functions**
Determine if each relationship represents a function.

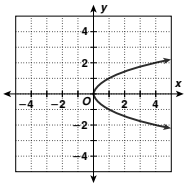
**A.**

| *x* | *y* |
|---|---|
| 2 | 4 |
| 6 | 8 |
| 10 | 12 |
| 14 | 16 |

Does each input (*x*) have only one output (*y*)? yes

Does the relationship represent a function? yes

**B.**




What are the output values for an input (*y*) value of 1? −1 and 1

Does the relationship represent a function? no

Copyright © by Holt, Rinehart and Winston. All rights reserved.


LESSON 3-5

## Ready to Go On? Skills Intervention

### *Equations, Graphs, and Tables*

You can use an equation to represent data in different ways.

**Using Equations to Generate Different Representations of Data**
The distance a car has traveled is represented by the equation $d = 45h$, where *d* is the distance traveled and *h* is the number of hours. Make a table and a graph of the equation.

| *h* | 45*h* | *d* |
|---|---|---|
| 0 | 45(0) | 0 |
| 1 | 45(1) | 45 |
| 2 | 45(2) | 90 |
| 3 | 45(3) | 135 |

To find *d*, multiply *h* by 45.

What is the distance after 0 hours? 0

After 1 hour? 45 After 3 hours? 135

Complete the table.

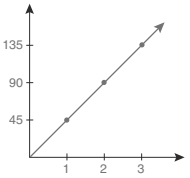
Use the information in the table to make a graph.

*h* represents the input and *d* represents the output.

What is the *x*-coordinate of the first point? 0

What is the *y*-coordinate of the first point? 0

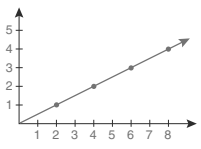
Make the graph.




**Using Tables to Generate Different Representations of Data**
Use the table to make a graph and write an equation.

| *x* | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| *y* | 1 | 2 | 3 | 4 |

Use the data in the graph to plot points on the graph.




What are the coordinates of the first point? (2, 1)

Complete the graph.

Look for a pattern in the values.

2 ÷ 2 = 1 4 ÷ 2 = 2

6 ÷ 2 = 3 8 ÷ 2 = 4

Each value of *y* is divided by 2 to get each value of *x*.

Write the equation. $y = x \div 2$

Copyright © by Holt, Rinehart and Winston. All rights reserved.


Copyright © by Holt, Rinehart and Winston. All rights reserved.

## LESSON 3-5 Ready to Go On? Problem Solving Intervention
### *Equations, Tables, and Graphs*

You can make a table and a graph to answer a word problem.

The amount of calories burned by swimming laps is represented by the equation $c = 12s$ where $c$ is the number of calories and $s$ is the number of laps. Use a table and a graph to find out how many calories Matilda burns when she swims 8 laps.

**Understand the Problem**

1. What quantity are you asked to find? number of calories burned
2. What do we know? the equation for calories burned by swimming laps

**Make a Plan**

3. How can a table help?

   Sample answer: I can find different values of $c$ for different numbers of laps.

4. Complete the table.
5. What is the first ordered pair from the table?
   1, 12 The second? 2, 24
6. How can you make a graph from the data in the table?

   plot the points and connect them
7. How will the graph help you answer the question?

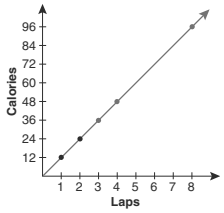
   Extend the graph to 8, find the corresponding value.

| $s$ | $12s$ | $c$ |
|---|---|---|
| 1 | 12(1) | 12 |
| 2 | 12(2) | 24 |
| 3 | 12(3) | 36 |
| 4 | 12(4) | 48 |

**Solve**

8. Make a graph for the data in the table.
9. Extend the graph. What is the value of $c$ when $s = 8$? 4
10. Answer the question.

    Matilda burns 96 calories.




**Check**

11. How can you show that your answer is reasonable?

    Solve the equation for $s = 8$. $c = 12(8) = 96$.

Copyright © by Holt, Rinehart and Winston. All rights reserved.


## LESSON 3-6 Ready to Go On? Skills Intervention
### *Arithmetic Sequences*

A **sequence** is an ordered list of items called **terms**. When the difference between each term is the same, it is called an **arithmetic sequence.** The difference between the terms in an arithmetic sequence is called the **common difference.**

**Vocabulary**
sequence
term
arithmetic sequence
common difference

**Finding the Common Difference in an Arithmetic Sequence**
Find the common difference in each arithmetic sequence.

**A.** 16, 13, 10, 7, 4…

What is the difference between the first and second terms? −3
Is this the same difference between the second and third terms? yes
Between the third and fourth terms? yes Common difference: −3.

**B.** 0.9, 1.4, 1.9, 2.4, 2.9…

What is the difference between the first and second terms? 1.5
Is this the same difference between the second and third terms? yes
Between the third and fourth terms? yes Common difference: 1.5.

**Finding Missing Terms in an Arithmetic Sequence**
Find the next three terms in the arithmetic sequence −6, −2, 2, 6,…

$-6 + 4 = -2$ $-2 + 4 = 2$ $2 + 4 = 6$

Common difference: 4.
Add 4 to the last term to get the next term. 10
Add 4 to that. 14 Add 4 to that. 18
The next three terms are 10, 14, 18.

**Identifying Functions in Arithmetic Sequences**
Find a function that describes the arithmetic sequence. Use $y$ to identify each term in the sequence and $n$ to identify the term's position.

3, 6, 9, 12

| $n$ | $n \cdot 3$ | $y$ |
|---|---|---|
| 1 | $1 \cdot 3$ | 3 |
| 2 | $2 \cdot 3$ | 6 |
| 3 | $3 \cdot 3$ | 9 |
| 4 | $4 \cdot 3$ | 12 |

Make a table.
What can you add to 1 to get the first term? add 2
Does this work to get the second term? no
What is another way to get the first term from 1? multiply by 3
Complete the table to see if this works for the other terms.
The rule is to multiply by 3.
The function for this arithmetic sequence is $y = 3n$.

Copyright © by Holt, Rinehart and Winston. All rights reserved.


## LESSON 3-6 Ready to Go On? Problem Solving Intervention
### *Arithmetic Sequences*

Finding a sequence can help you solve a word problem.

Tickets to a high school football game cost $4 each. The equipment manager and the concession stand manager each get $75 each game to replenish their supplies. Find a function to describe the sequence. Then find the profit if 127 tickets are sold.

**Understand the Problem**

1. What information do you have?

   cost of a ticket, amount of money taken out of profits
2. What are you trying to find?

   function for the sequence of ticket sales

**Make a Plan**

3. How much money does the school make from the sale of one ticket? Two tickets? $4, $8
4. Write the first ten terms in the sequence for ticket sales.

   4, 8, 12, 16, 20, 24, 28, 32, 26, 40
5. What is the common difference? 4
6. How can you find a function for the profit?

   Multiply 4 by the number of tickets sold, subtract the money given to the equipment manager and concession stand manager.

**Solve**

7. What is the function that describes the profit from ticket sales? $p = 4t - 150$
8. What is $f(127)$? $358

**Check**

9. Substitute 358 for $p$ in your function. Is the function true?

   $358 = 4t - 150$: $t = 127$; yes

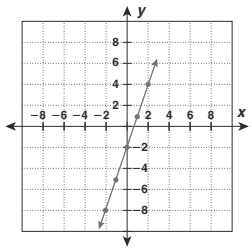
Copyright © by Holt, Rinehart and Winston. All rights reserved.


## SECTION 3B Ready to Go On? Quiz

**3-4 Functions**
**Make a table and a graph for the function.**

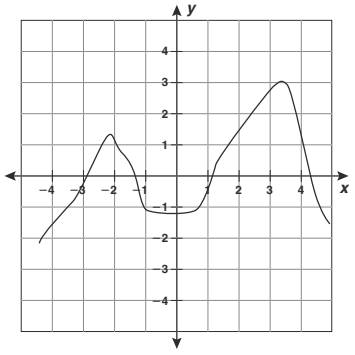
1. $y = 3x - 2$

| $x$ | $3x - 2$ | $y$ |
|---|---|---|
| −2 | $3(-2) - 2$ | −8 |
| −1 | $3(-1) - 2$ | −5 |
| 0 | $3(0) - 2$ | −2 |
| 1 | $3(1) - 2$ | 1 |
| 2 | $3(2) - 2$ | 4 |




**Determine if each relationship represents a function.**

2.




yes

3.

| $x$ | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| $y$ | 8 | 12 | 15 | 16 |

yes

4.

| $x$ | 5 | 6 | 5 | 7 |
|---|---|---|---|---|
| $y$ | 8 | 11 | 14 | 17 |

no

5. $y = x^2 + 2$ no
6. $y = 3x + 2$ yes

Copyright © by Holt, Rinehart and Winston. All rights reserved.


Copyright © by Holt, Rinehart and Winston. All rights reserved.

## SECTION 3B Ready to Go On? Quiz continued

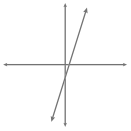
### 3-5 Equations, Tables, and Graphs

**Use each table to make a graph and write an equation.**

**7.**

| $x$ | 1 | 3 | 5 | 7 |
|---|---|---|---|---|
| $y$ | 3 | 11 | 19 | 27 |

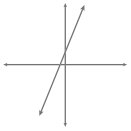
$y = 4x - 1$



**8.**

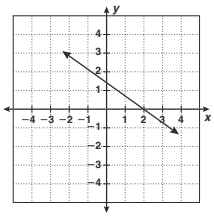
| $x$ | 2 | 5 | 8 | 11 |
|---|---|---|---|---|
| $y$ | 7 | 13 | 19 | 25 |

$y = 2x + 3$



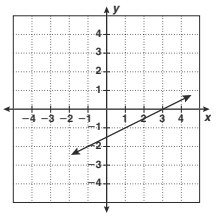
**Use each graph to write an equation.**

**9.**



$y = -\frac{3}{4}x + \frac{3}{2}$

**10.**



$y = \frac{1}{2}x - \frac{3}{2}$

### 3-6 Arithmetic Sequences

**Find the missing term in each sequence.**

**11.** 4, 7, 10, 13, ___16___, 19

**12.** −3, −9, −15, ___−21___, −27, −33

**13.** 4.7, 5.6, 6.5, 7.4, ___8.3___, 9.2

**14.** 2, 4, 8, ___16___, 32, 64

**15.** The swim team is selling tickets for $5 for admission to a swim party. The cost to rent the pool is $130. Find a function that describes the profit. What is the profit if they sell 200 tickets?

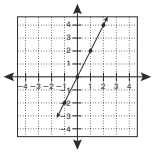
$p = 5t - 130$; $870

Copyright © by Holt, Rinehart and Winston. All rights reserved.


## SECTION 3B Ready to Go On? Enrichment

### *Using a Graph to Solve Word Problems*

You can use a graph to help you answer word problems. Look at the graph below.



Does it show a positive or negative relationship? positive

For every unit to the right, how much does the line rise? 2 units

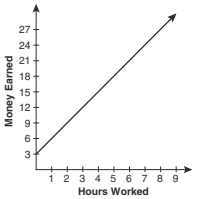
This amount of vertical change divided by the amount of horizontal change is called slope. It tells you what the variable in the equation of the line is multiplied by.

When $x = 0$, what does $y$ equal? 0

This means that there is no number added to the variable in the equation of the line.

What is the equation of this line? $y = 2x$

Jaqueline made this graph of her rate for doing yard work. Answer the questions below based on her graph.




1. Jaqueline has an initial charge to cover supplies for each client. What is it? $3
2. What is Jaqueline's hourly rate? $3 per hour
3. Write an equation to describe Jaqueline's rate. Use $h$ for the number of hours and $t$ for the total amount of money she makes. $t = 3h + 3$
4. Explain why the number multiplied by the variable is not 1, even though the graph looks like the line rises at a 1 to 1 ratio.

   Sample answer: The scale of the $x$- and $y$-axis are different. On the $y$-axis, one unit represents $3.

5. Jaqueline spent 2 hours weeding Mrs. Olsen's garden. Use the equation from Exercise 3 to find her pay. $9
6. Jaqueline spent 3 hours working in her mother's yard. As a familiy discount, she took off the supply charge. How much did Jaqueline earn from her mother? $9
7. Saturday, Jaqueline spent 2 hours mowing Mr. Harrison's lawn. Then she spent 1 hour pruning Mrs. Peterson's shrubs. Finally, she spent $1\frac{1}{2}$ hours raking leaves at Miss Ryder's house. How much did Jaqueline make on Saturday? (Each get a supply charge.) $22.50

Copyright © by Holt, Rinehart and Winston. All rights reserved.


## LESSON 4-1 Ready to Go On? Skills Intervention

### *Exponents*

A **power** is a term such as $3^2$ where the **base** is 3 and the **exponent** is 2. The exponent tells how many times the base is to be used as a factor. A number written with an exponent and a base is written in **exponential form.**

**Vocabulary**
power
base
exponent
exponential form

**Writing Exponents**

Write using exponents.

**A.** 5 • 5 • 5 • 5

How many times is 5 a factor? 4

5 • 5 • 5 • 5 = $5^4$

The base is 5. The exponent is 4.

**B.** (−6) • (−6) • (−6)

How many times is −6 a factor? 3

(−6) • (−6) • (−6) = $(-6)^3$

The base is −6. The exponent is 3.

**C.** $x \cdot x \cdot x \cdot x \cdot x \cdot x$

How many times is $x$ a factor? 6

$x \cdot x \cdot x \cdot x \cdot x \cdot x = x^6$

The base is $x$. The exponent is 6.

**D.** 4

How many times is 4 a factor? 1

$4 = 4^1$

The base is 4. The exponent is 1.

**Evaluating Powers**

Evaluate.

**A.** $3^5$

How many times is 3 multiplied? 5

$3^5 = 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3$

Find the product of five 3's. 243

$3^5 = 243$

**B.** $(-4)^3$

How many times is −4 multiplied? 3

$(-4)^3 = (-4) \cdot (-4) \cdot (-4)$

Find the product of three −4's. −64

$(-4)^3 = -64$

**Using the Order of Operations**

Evaluate.

$x(y + z^x)$ for $x = 2$, $y = 10$, and $z = 5$

2 (10 + $5^2$) Substitute

2(10 + 25) What operation do you do first? Evaluate the exponent.

2 (35) What do you do next? Simplify inside parentheses.

70 Multiply.

Copyright © by Holt, Rinehart and Winston. All rights reserved.


## LESSON 4-2 Ready to Go On? Skills Intervention

### *Look for a Pattern in Integer Exponents*

A number raised to a negative exponent equals one divided by that number raised to the opposite of the exponent.

**Using a Pattern to Evaluate Negative Exponents**

Evaluate the powers of 10.

$10^{-2}$ Is the exponent positive or negative? negative

$10^{-2} = \frac{1}{10 \cdot 10}$ Write the reciprocal and extend the pattern.

$10^{-2} = \frac{1}{100} = 0.01$ Simplify and write the fraction as a decimal.

**Evaluating Negative Exponents**

Evaluate.

$(-3)^{-5}$ What is the exponent? −5

$\frac{1}{(-3)^5}$ When an exponent is negative, write the reciprocal.

What is the sign of the exponent, now? positive

$\frac{1}{-3} \cdot \frac{1}{-3} \cdot \frac{1}{-3} \cdot \frac{1}{-3} \cdot \frac{1}{-3}$ Write the product of $5\ \frac{1}{-3}$.

$\frac{1}{-243}$ Simplify.

**Using the Order of Operations**

Evaluate.

$4 - 5^0 + (7 - 5)^{-4}$

$4 - 5^0 + (2)^{-4}$ What operation do you do first?

Simplify inside parentheses.

What operation do you do next? Evaluate the exponents.

$4 - 1 + \frac{1}{2^4}$ A number with 0 as an exponent equals 1.

To change the sign of an exponent, write the reciprocal.

$4 - 1 + \frac{1}{16}$ Simplify.

$3\frac{1}{16}$ Add and subtract from left to right.

Copyright © by Holt, Rinehart and Winston. All rights reserved.


Copyright © by Holt, Rinehart and Winston. All rights reserved.