

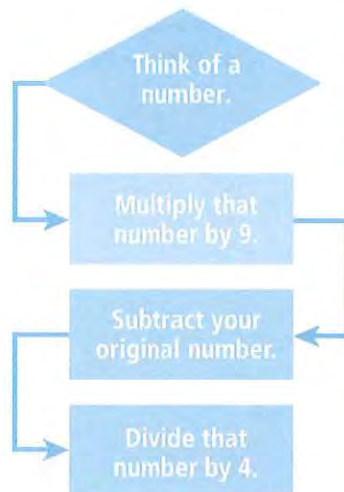
# 3-2

## Linear Functions

### MODEL & DISCUSS

The flowchart shows the steps of a math puzzle.

A. Try the puzzle with 6 different integers.



B. Record each number you try and the result.

C. Make a prediction about what the final number will be for any number. Explain.

D. **Use Structure** Would your prediction be true for all numbers? Explain. © MP.7

#### HABITS OF MIND

**Construct Arguments** Is it possible to find a counterexample? © MP.3

**EXAMPLE 1**  **Try It!** Evaluate Functions in Function Notation1. Evaluate each function for  $x = 4$ .

a.  $g(x) = -2x - 3$

b.  $h(x) = 7x + 15$

**EXAMPLE 2**  **Try It!** Write a Linear Function Rule

2. Write a linear function for the data in each table using function notation.

a. 

$x$	1	2	3	4
$y$	6.5	13	19.5	26

b. 

$x$	1	2	3	4
$y$	1	4	7	10

**HABITS OF MIND****Look for Relationships** What can the relationship between the values of  $x$  and the values of  $y$  reveal about a function? © MP.7

**EXAMPLE 3**  **Try It! Analyze a Linear Function**

3. Sketch the graph of each function.

a.  $f(x) = -x + 1$

b.  $f(x) = 3x + 1$

**EXAMPLE 4**  **Try It! Use Linear Functions to Solve Problems**

4. In Example 4, how would the function, graph, and equation change if the speed is 4 mph? What is the effect on the domain?

**HABITS OF MIND**

**Reason** How is a linear function related to a linear equation? Explain. © MP.2

## Do You UNDERSTAND?

- ESSENTIAL QUESTION** How can you identify a linear function?
- Communicate Precisely** Give a real-world example of a function that is linear and one that is not linear. Explain. © MP.6
- Vocabulary** What is the difference between a *linear function* and a linear equation?
- Error Analysis** The cost of using a game facility is \$1 for every 12 minutes. Talisa writes the function for the cost per hour as  $f(x) = 12x$ . Explain Talisa's error. © MP.3

## Do You KNOW HOW?

Evaluate each function for  $x = 2$  and  $x = 6$ .

5.  $f(x) = 4x - 3$

6.  $f(x) = -(x - 2)$

7. Sketch the graph of  $f(x) = \frac{1}{2}x + 5$ .

- What function models the height of the periscope lens at time  $t$ ? If the periscope reaches its maximum height after ascending for 22 seconds, what is the maximum height in feet?

