

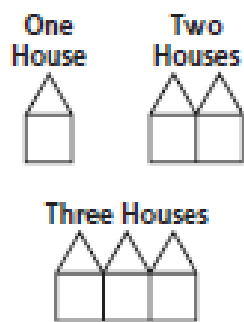
Objective: TSWBAT identify and represent patterns that describe linear functions

## Vocabulary

- ① function - a relationship that pairs each input value with exactly one output value
- ② linear function - a function whose graph is a non vertical line or part of a nonvertical line

\* input (independent variable)

output (dependent variable)



## 2 EXAMPLE Writing a Function Rule

The relationship between the number of houses (input) and the number of toothpicks (output) is a function. Use the table to write a function rule.

Number of Houses	1	2	3	4
Total Number of Toothpicks	6	11	16	21

**Relate** Total number of toothpicks is one more than five times the number of houses. Describe how the quantities relate.

**Define** Let  $n$  = the number of houses. The number of houses is the input.  
 Let  $t$  = the total number of toothpicks. The total number of toothpicks is the output.

**Laundry** Suppose you are washing and drying clothes at a self-service laundry. The relationship between the number of loads (input) and the cost (output) is a function. Use the table to write a function rule.

Number of Loads	1	2	3	4
Cost	\$2.75	\$5.50	\$8.25	\$11.00

- 1 Write a function rule for the relationship between the number of hours (input) and the number of miles

Hours	1	2	3	4
Total Miles	60	120	180	240



## Problem 2 Representing a Linear Function

**Photography** The table shows the relationship between the number of photos  $x$  you take and the amount of memory  $y$  in megabytes (MB) left on your camera's memory chip. Is the relationship a linear function? Describe the relationship using words, an equation, and a graph.

Camera Memory

Number of Photos, $x$	Memory (MB), $y$
0	512
1	509
2	506
3	503

16. a. Look at the pattern below. Make a table that relates the figure number  $n$  to the number of hexagons  $h$ .



Figure 1

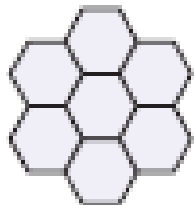


Figure 2

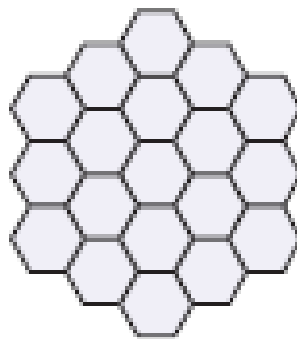


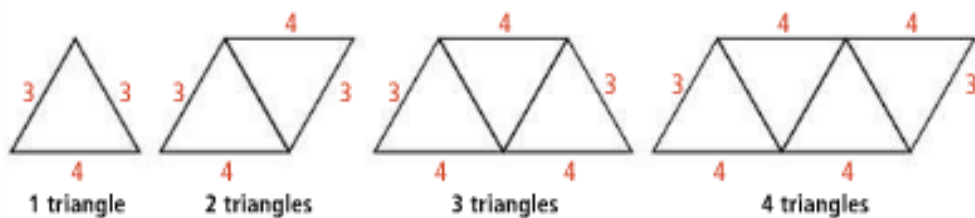
Figure 3

- b. **Predict** What will be the number of hexagons in Figure 4?  
c. Does your table represent a function? Explain.



**Got It?**

1. a. In the diagram below, what is the relationship between the number of triangles and the perimeter of the figure they form? Represent this relationship using a table, words, an equation, and a graph.



- b. **Reasoning** Suppose you know the perimeter of  $n$  triangles. What would you do to find the perimeter of  $n + 1$  triangles?
- c. How does your answer to part (b) relate to the equation you wrote in part (a)?



**Got It?**

2. a. Is the relationship in the table below a linear function? Describe the relationship using words, an equation, and a graph.

Input, $x$	0	1	2	3
Output, $y$	8	10	12	14

- b. **Reasoning** Does the set of ordered pairs  $(0, 2)$ ,  $(1, 4)$ ,  $(3, 5)$ , and  $(1, 8)$  represent a linear function? Explain.
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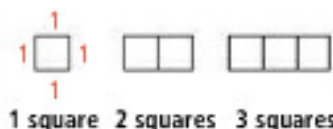
## Lesson Check

### Do you know HOW?

- Graph each set of ordered pairs. Use words to describe the pattern shown in the graph.
  - $(0, 0), (1, 1), (2, 2), (3, 3), (4, 4)$
  - $(0, 8), (1, 6), (2, 4), (3, 2), (4, 0)$
  - $(3, 0), (3, 1), (3, 2), (3, 3), (3, 4)$

- Use the diagram below.

Copy and complete the table showing the relationship between the number of squares and the perimeter of the figure they form.



Number of Squares	Perimeter
1	4
2	6
3	■
4	■
10	■
■	62
$n$	■