

Alg 1 Friday Week 8

Warm Up

Skill 3: Solve and Graph Compound Inequalities on a Number Line

$$5n - 1 < -16 \quad \text{or} \quad -3n - 1 < 8$$



Skill 4: Solve and Graph Absolute Value Inequalities and Equations

$$2|-6r - 4| < 16$$



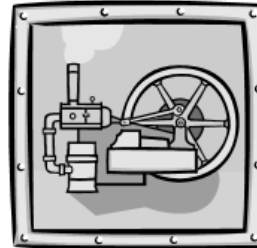
**CW** The Function Machine



Wk 8, Friday

**W**e have seen how mathematical expressions can be thought of as machines, too, except instead of slicing, grating, hauling, or grinding, the purpose of mathematical functions is to do certain operations on whatever number goes in. For example, the function performed by the expression  $2x - 4$  is to find 4 less than twice the number that went in (the *domain* value). Use the information provided about what went into each machine and what came out to determine what operations are being performed by each function machine.

1.  $in \rightarrow [f] \rightarrow out$   
 $2 \rightarrow [f] \rightarrow 7$   
 $8 \rightarrow [f] \rightarrow 13$   
 $20 \rightarrow [f] \rightarrow 25$   
 $35 \rightarrow [f] \rightarrow ?$



2.  $f(in) \rightarrow out$   
 $f(6) \rightarrow 3$   
 $f(10) \rightarrow 7$   
 $f(15) \rightarrow 12$   
 $f(23) \rightarrow ?$

3.

| Domain Value | Range Value |
|--------------|-------------|
| 5            | 15          |
| 2            | 6           |
| 100          | 300         |
| 25           | ?           |

4.  $Domain \rightarrow Range$   
 $10 \rightarrow 4$   
 $2.5 \rightarrow 1$   
 $30 \rightarrow 12$   
 $17.5 \rightarrow ?$

5. (Domain Value, Range Value)  
 $(2, 3)$   
 $(5, 24)$   
 $(10, 99)$   
 $(7, ?)$

In the next few problems, the name on the function machine tells you what operations it performs. Use this information to fill in the blanks.

6.  $Domain \# \rightarrow [\sqrt{\text{domain \#}}] \rightarrow Range \#$   
 $9 \rightarrow [\sqrt{\text{domain \#}}] \rightarrow \underline{\hspace{2cm}}$   
 $64 \rightarrow [\sqrt{\text{domain \#}}] \rightarrow \underline{\hspace{2cm}}$   
 $16 \rightarrow [\sqrt{\text{domain \#}}] \rightarrow \underline{\hspace{2cm}}$   
 $36 \rightarrow [\sqrt{\text{domain \#}}] \rightarrow \underline{\hspace{2cm}}$

7.  $IN \rightarrow [3 \cdot IN + 1] \rightarrow OUT$   
 $0 \rightarrow [3 \cdot IN + 1] \rightarrow \underline{\hspace{2cm}}$   
 $2 \rightarrow [3 \cdot IN + 1] \rightarrow \underline{\hspace{2cm}}$   
 $10 \rightarrow [3 \cdot IN + 1] \rightarrow \underline{\hspace{2cm}}$   
 $-2 \rightarrow [3 \cdot IN + 1] \rightarrow \underline{\hspace{2cm}}$

8.  $(x, -16x^2 + 100)$   
 $(0, \underline{\hspace{2cm}})$   
 $(1, \underline{\hspace{2cm}})$   
 $(2, \underline{\hspace{2cm}})$   
 $(3, \underline{\hspace{2cm}})$

9.  $f(n) = |3 - n|$   
 $f(0) = \underline{\hspace{2cm}}$   
 $f(2) = \underline{\hspace{2cm}}$   
 $f(5) = \underline{\hspace{2cm}}$   
 $f(-4) = \underline{\hspace{2cm}}$

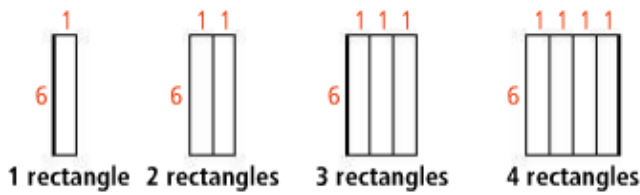
Scrambled answers: -44, -5, 1, 1, 2, 3, 3, 4, 6, 7, 7, 7, 8, 20, 31, 36, 40, 48, 75, 84, 100

## Notes/examples for 4-2: Patterns and Linear Functions



### Problem 1 Representing a Geometric Relationship

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



**Words**

**Equation**

**Table**

| Number of Rectangles, $x$ | Perimeter, $y$ | Ordered Pair $(x, y)$ |
|---------------------------|----------------|-----------------------|
| 1                         |                |                       |
| 2                         |                |                       |
| 3                         |                |                       |
| 4                         |                |                       |

**Graph**

**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,<br>$x$ | Memory (MB),<br>$y$ |
|--------------------------|---------------------|
| 0                        | 512                 |
| 1                        | 509                 |
| 2                        | 506                 |
| 3                        | 503                 |

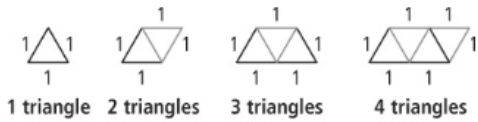
**Words****Equation****Graph**

# 4-2 Practice

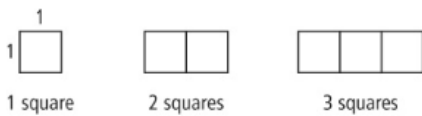
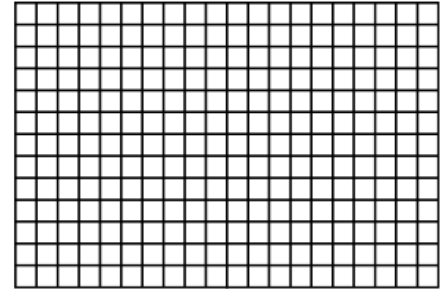
## Patterns and Linear Functions

Form G

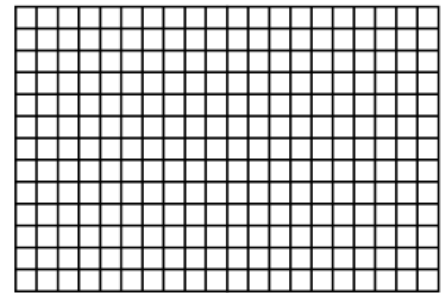
For each diagram, find the relationship between the number of shapes and the perimeter of the figure they form. Represent this relationship using a table, words, an equation, and a graph.



|           |   |   |   |   |   |   |    |     |
|-----------|---|---|---|---|---|---|----|-----|
| Triangles | 1 | 2 | 3 | 4 | 5 | 6 |    | $n$ |
| Perimeter | 3 | 4 | 5 |   |   |   | 12 |     |



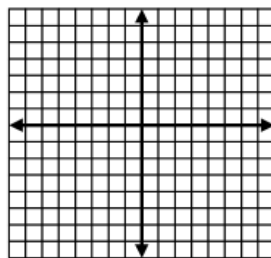
|           |   |   |   |   |   |   |    |     |
|-----------|---|---|---|---|---|---|----|-----|
| Squares   | 1 | 2 | 3 | 4 | 5 | 6 |    | $n$ |
| Perimeter | 4 | 6 | 8 |   |   |   | 22 |     |



For each table, determine whether the relationship is a function. Then represent the relationship using words, an equation, and a graph.

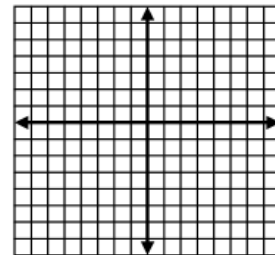
3.

|   |   |
|---|---|
| x | y |
| 0 | 1 |
| 1 | 3 |
| 2 | 5 |
| 3 | 7 |



4.

|   |   |
|---|---|
| x | y |
| 0 | 6 |
| 1 | 7 |
| 2 | 8 |
| 3 | 9 |



# 4-2 Practice

(continued)

## Patterns and Linear Functions

Form G

For each table, determine whether the relationship is a function. Then represent the relationship using words, an equation, and a graph.

**5. Distance Traveled**

| Time (h) | Distance (mi) |
|----------|---------------|
| 0        | 0             |
| 1        | 55            |
| 2        | 110           |
| 3        | 165           |

**6. Calories Burned**

| Minutes (min) | Calories (C) |
|---------------|--------------|
| 0             | 0            |
| 10            | 50           |
| 20            | 100          |
| 30            | 150          |

- 7. Reasoning** Graph the set of ordered pairs  $(0, 2)$ ,  $(1, 4)$ ,  $(2, 6)$ ,  $(3, 8)$ . Determine whether the relationship is a linear function. Explain how you know.

- 8.** You can make a bubble solution by mixing 1 cup of liquid soap with 4 cups of water. Represent the relationship between the cups of liquid soap and the cups of bubble solution made using a table, an equation, and a graph. Is the amount of bubble solution made a function of the amount of liquid soap used? Explain.