

# Unit 4: Function Notation

Name Rogers Key

### Objectives:

- Identify if a function is written in function notation.
- Identify the parent linear function.
- Compare the parent linear function to graph of other linear functions.
- Evaluate a function for a given value.

## 4.7 Function Notation

\*When you write the function  $y = mx + b$  as  $f(x) = mx + b$ , you are using FUNCTION NOTATION.

Pronounced: "f of x"

### Practice 1: Rewrite in function notation.

a)  $y = 7x + 3$

$f(x) = 7x + 3$

b)  $y = 2x - 8$

$f(x) = 2x - 8$

c)  $y = -\frac{1}{3}x - 1$

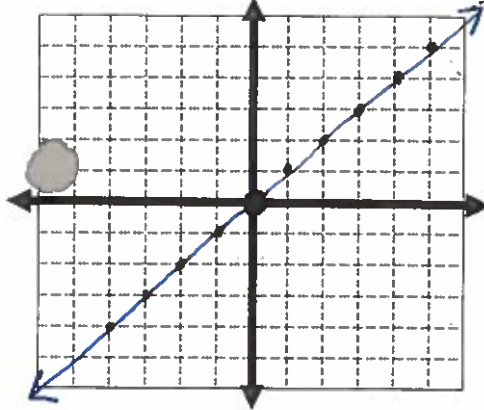
$f(x) = -\frac{1}{3}x - 1$

### Parent Linear Function

LINES  $f(x) = x$

$f(x) = x$

All  $y = mx + b$  functions (linear functions) are transformations of this *function family*.



$f(x) = x$  Slope: 1 y-intercept: 0

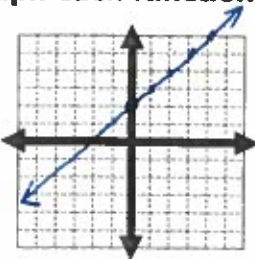
### Transformations

Transformations CHANGE the graph.

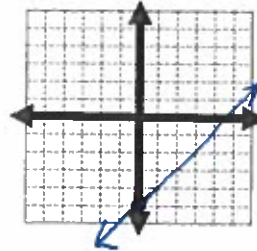
### Practice 2: Graph each function and compare to the graph of the parent function $f(x) = x$ .

a)  $f(x) = x + 2$

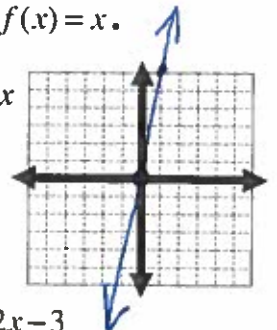
$m = 1$   
 $b = 2$



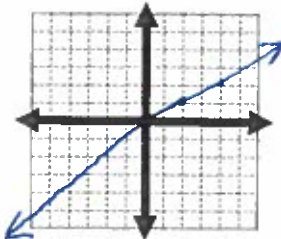
b)  $f(x) = x - 5$



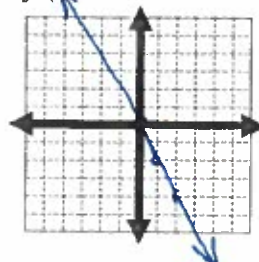
c)  $f(x) = 6x$



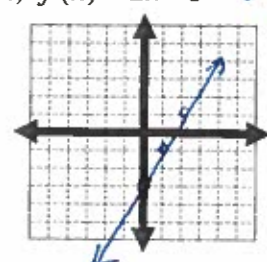
d)  $f(x) = \frac{1}{2}x$



e)  $f(x) = -2x$



f)  $f(x) = 2x - 3$



## Evaluating Functions

**Practice 3:** Evaluate each function when  $x = 0, 2, -3$ .

a)  $g(x) = x + 1$

$$g(0) = 0 + 1 = 1$$

$$g(2) = 2 + 1 = 3$$

$$g(-3) = -3 + 1 = -2$$

b)  $h(x) = 2x - 3$

$$h(0) = 2(0) - 3 = -3$$

$$h(2) = 2(2) - 3 = 1$$

$$h(-3) = 2(-3) - 3 = -9$$

c) For the function  $f(x) = 2x + 12$ , find  $f(5)$ .

$$f(5) = 2(5) + 12$$

$$10 + 12$$

$$\text{INPUT } f(5) = 22 \text{ OUTPUT}$$

d) For the function  $f(x) = 3x - 1$ , find  $f(4)$ .

$$f(4) = 3(4) - 1$$

$$12 - 1$$

$$f(4) = 11$$

**Practice 4:** Find the value of  $x$  so that the function has the given value.

INPUT

(GO BACKWARDS)

**Read Carefully.** In these problems, you are given the OUTPUT value. You are asked to solve for INPUT.

a) For  $g(x) = 5x + 3$ , find  $x$  if  $g(x) = 18$

OUTPUT

$$18 = 5x + 3$$

$$\frac{18 - 3}{5} = \frac{5x}{5}$$

$$3 = x$$

b)  $f(x) = 2x + 12$ ; 16

$$16 = 2x + 12$$

$$-12 \quad -12$$

$$\frac{4}{2} = \frac{2x}{2}$$

$$2 = x$$

c) For  $h(x) = 2x - 3$ ; 9

$$9 = 2x - 3$$

$$+3 \quad +3$$

$$\frac{12}{2} = \frac{2x}{2}$$

$$6 = x$$

d) For  $j(x) = 4x - 8$ , find  $x$  if  $j(x) = 20$

$$20 = 4x - 8$$

$$+8 \quad +8$$

$$\frac{28}{4} = \frac{4x}{4}$$

$$7 = x$$

# Function Notation

"Name of the function"  
LETTER CAN CHANGE

$$f(x) =$$

↓  
INPUT

$$g(x)$$

equation

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↓  
OUTPUT

$$f(x) = 2x - 4$$

input: ☆

$$f(\star) = 2\star - 4$$

INPUT: ♥

$$f(\heartsuit) = 2\heartsuit - 4$$

$$d(x) = \frac{1}{2}x + 6$$

Let  $x = \star$

$$d(\star) = \frac{1}{2}\star + 6$$

Let  $x = 4$

$$d(4) = \frac{1}{2}(4) + 6$$

2 + 6

$$d(4) = 8$$

INPUT

OUTPUT

