

Name:

Date:

Period:

**Function notation** is a special notation used only for functions. Typically, with function notation, the  $y$  is replaced with  $f(x)$ , read as "f of x". In function notation, the equation  $y = 2x + 8$  is written as  $f(x) = 2x + 8$ .

It is important to note that  $f(x)$  is not the only variable used in function notation. You may see  $g(x)$ , or  $h(x)$ , or even  $b(a)$ . You can use any letters, but they must be in the same format - a variable followed by another variable in parentheses.

Often times you will see letters that are related to the subject of the problem. For example, if the problem involves writing an equation to determine the distance a car travels based on a certain time driving, the function could be written as  $d(t)$  for "the distance based on the time". The variable,  $t$ , represents "time" as the input and  $d(t)$  is the outcome.

### Evaluating Functions in $f(x)$ Format

To evaluate a function, simply replace (**substitute**) the function's variable with the indicated number or expression.

Evaluate the following expressions given the functions below:

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

$$f(x) = x^2 + 7$$

$$h(x) = \frac{12}{x}$$

$$j(x) = 2x + 9$$

a.  $g(10) =$

b.  $f(3) =$

c.  $h(-2) =$

d.  $j(7) =$

e. Find  $x$  if  $g(x) = 16$

f. Find  $x$  if  $h(x) = -4$

g. Find  $x$  if  $f(x) = 23$

h. Find  $x$  if  $j(x) = 29$

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Translate the following statements into coordinate points:

a.  $f(-1) = 1$

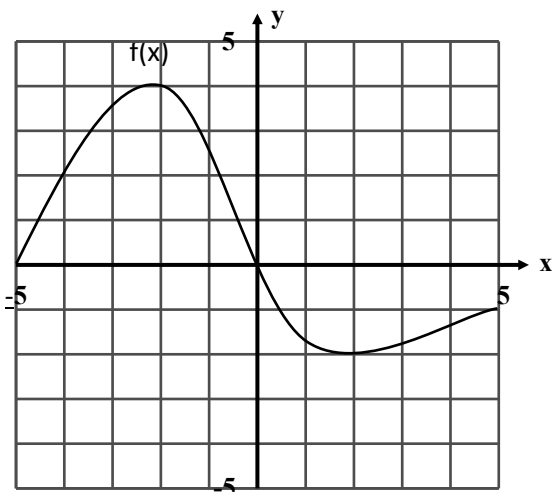
b.  $h(2) = 7$

c.  $g(1) = -1$

d.  $k(3) = 9$

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Use the graph to answer the questions. Find:



a.  $f(-4) =$

b.  $f(0) =$

c.  $f(2) =$

d.  $f(-5) =$

e.  $x$  when  $f(x) = 4$

f.  $x$  when  $f(x) = 0$

1. If  $f(x) = 4x + 6$ , find  $f(3)$ .

2. If  $R(v) = v^3 + 3v^2 - 5v - 6$ , find  $R(-2)$ .

3. Given the functions  $f(x) = 3x + 2$  and  $g(x) = -x + 10$ , find the value of  $x$  for which  $f(x) = g(x)$ .

4. Given the functions  $f(x) = 4x - 2$  and  $g(x) = 2x + 4$ , find the value of  $x$  for which  $f(x) = g(x)$ .

5. Neal has a \$5 gift card for music downloads. Each song costs \$1 to download. The amount of money left on the card, in dollars, can be represented by the function  $f(x) = 5 - x$ , where  $x$  is the number of downloaded songs.

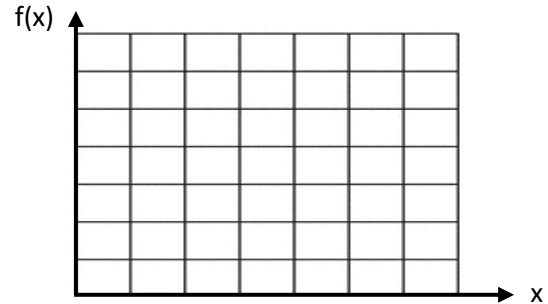
a. Complete the table

<b>x</b>	0					5
<b>f(x)</b>						

b. Graph the function. (To connect or not to connect?)

c. Identify the domain and range of the function.

Domain: \_\_\_\_\_ Range: \_\_\_\_\_



6. Sam is trying to lose weight, and George is trying to gain weight. Sam's weight in pounds can be represented by the function  $f(x) = 240 - 2x$ , where  $x$  is the number of weeks since Sam started losing weight. George's weight in pounds can be represented by the function  $g(x) = 180 + 4x$ , where  $x$  is the number of weeks since George starting gaining weight.

- What is the  $x$ -value when  $f(x) = g(x)$
- When  $f(x) = g(x)$ , what does the  $x$ -value represent?
- When Sam and George weigh the same, what will their weight be?

7. Jasmine has \$15 dollars and saves \$2.50 every month. Radha has \$0 and saves \$3.50 every month. Jasmine's savings after  $x$  months can be represented by the function  $f(x) = 2.5x + 15$ . Radha's savings after  $x$  months can be represented by the function  $g(x) = 3.5x$ .

- After how many months will they both have the same amount in savings?
- Explain how to check your work.
- Explain what the graph of the two functions would look like.

8. Marco owed his father \$150 and began paying him back \$20 at the end of each week, beginning November 1. Joni owed her father \$130 and began paying him back \$15 at the end of each week, beginning on the same day. What Marco owed his father in dollars at the end of  $n$  weeks can be represented by  $f(n) = 150 - 20n$ . What Joni owed her father in dollars at the end of  $n$  weeks can be represented by  $g(n) = 130 - 15n$ .

- Find the value of  $n$  for which  $f(n) = g(n)$ .
- What does that value mean in this situation?