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math instruction

Lesson 1.02 Evaluating Functions
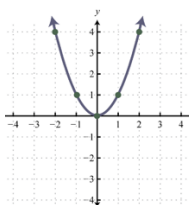
Students will be able to:

- <u>Content Objective:</u> Evaluate functions algebraically and graphically using function notation.

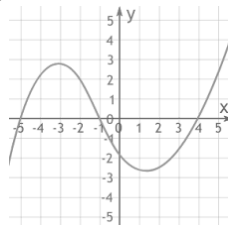- <u>Language Objective:</u> Explain how to find a solution to an equation where two functions are equal.

Warm Up

Multiple Choice– Which of the following represents a one-to-one function?

a.

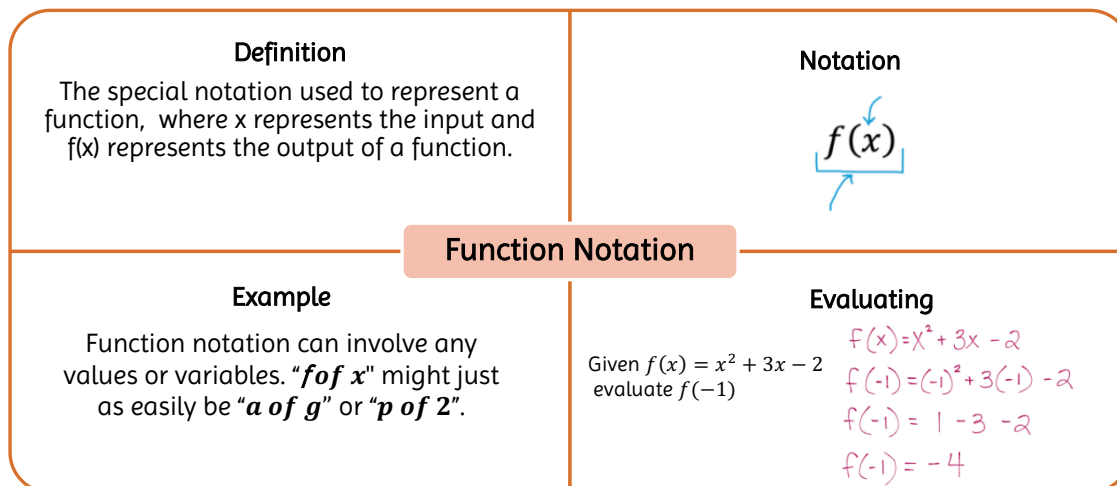b. $\{(1,8),(2,6),(3,4),(4,7)\}$

c.

d.

x	$f(x)$
-2	4
-1	1
0	0
1	1
2	4

Vocabulary Review

Matching: Match each word to the corresponding statement.

___1. Input   a. The second value in a coordinate point. The y-values.

___2. Function   b. The first value in a coordinate point. The x-values.

___3. Output   c. Read as "$f\ of\ x$". Written as $f(x)$

___4. Function notation   d. A relation that assigns each input to a single output.

___5. One to one   e. This function passes the horizontal line test.

Graphic Organizer

Definition

The special notation used to represent a function, where x represents the input and f(x) represents the output of a function.

Notation

$f(x)$

Function Notation

Example

Function notation can involve any values or variables. "$fof\ x$" might just as easily be "$a\ of\ g$" or "$p\ of\ 2$".

Evaluating

Given $f(x) = x^2 + 3x - 2$ evaluate $f(-1)$

$f(x) = x^2 + 3x - 2$
$f(-1) = (-1)^2 + 3(-1) - 2$
$f(-1) = 1 - 3 - 2$
$f(-1) = -4$

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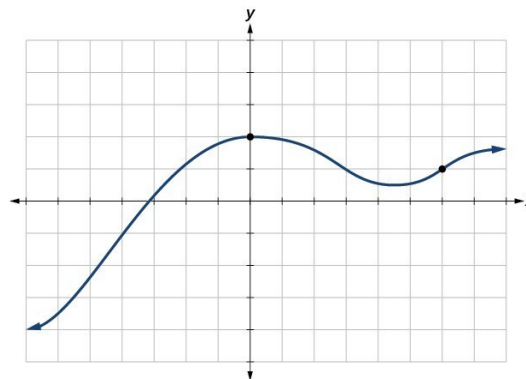
Skill 1: Evaluate on a Graph

Using the function graphed below, evaluate the following:

a. $f(2)$

b. $f(0)$

c. $f(-3)$
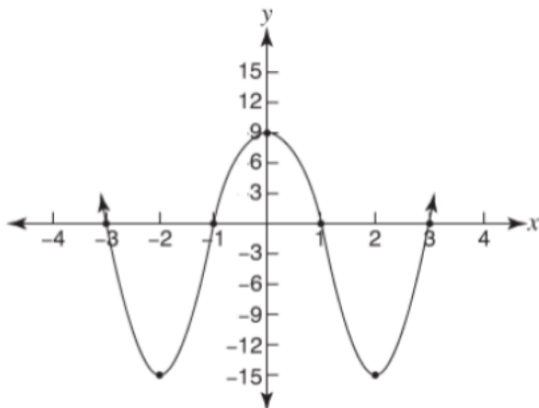
d. For what value(s) of x does $f(x) = 9$?

e. For what value(s) of x does $f(x) = 0$?

Exercise 1: Evaluate on a Graph

Using the function graphed below, evaluate the following:

a. $f(3)$

b. $f(-2)$

c. $f(6)$

d. For what value(s) of x does $f(x) = 1$?

e. For what value(s) of x does $f(x) = 2$?

Skill 2: Evaluate Algebraically

Use the function below to evaluate the following:

$$h(x) = \frac{x^2 - 4}{2}$$

a. $h(0) =$

b. $h(2) + h(6) =$

d. $h(2w) =$

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Exercise 2: Evaluate Algebraically

Use the function below to evaluate the following:

$$f(x) = x^2 + 2x + 1$$
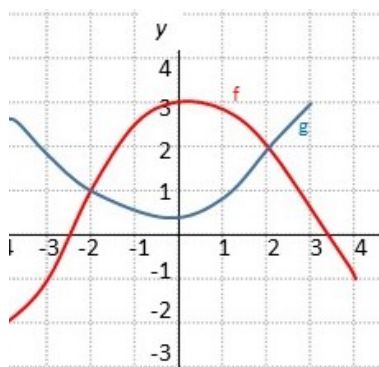
a. $f(-1) =$

b. $f(2) \cdot f(0) =$

c. $f(3x) =$

Write It Out

The functions $f(x)$ and $g(x)$ are graphed on the coordinate plane below.

a.   How can you determine an input where $f(x) = g(x)$? Explain.

b.   Determine the input values for $f(x) = g(x)$.

Check Point

1. **Multiple Choice** – Let $f(x) = 5x + 2$. If $f(x) = 27$, determine the value of x.

    1)   25

    2)   5

    3)   137

    4)   29

2. The functions f and h are defined below:

    $$f(x) = 4x + 3$$

    $$h(x) = 1 + f(x)$$

    What is the value of $h(2)$?

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1.02-Problem Set

Name:_____

1. Use the table below to evaluate the following:

a. $h(3) =$

b. $h(2) - h(4) =$

c. If $h(x) = 3$, what is the value of x?

x	$f(x)$
0	3
1	6
2	9
3	12
4	15

2. Use the graph below of the functions $g(x)$ and $f(x)$ to answer the following questions.
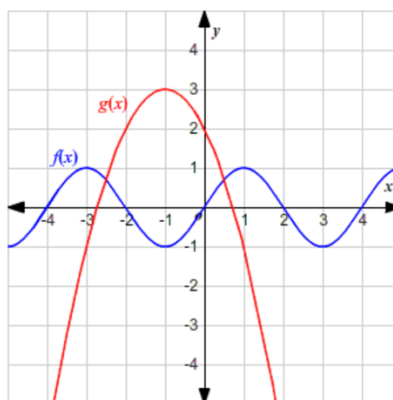
a. Find an input value where $f(x) + g(x) = 0$. Note that there are multiple possible solutions.

b. Find an input value where $f(x) - g(x) = -2$. Note that there are multiple possible solutions.

3. If $f(x) = 7x - 5$ and $g(x) = 3x + 11$, what value of x does $f(x) = g(x)$?