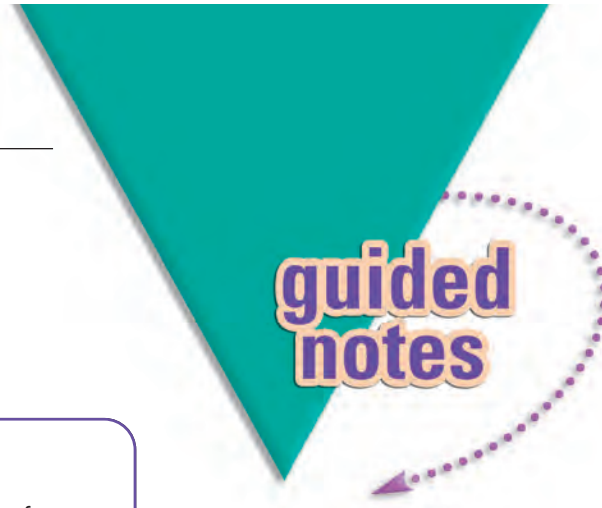


NAME _____

Module 9 Using Functions
Lesson 6 Evaluating Composite Functions



guided
notes

Lesson Objectives

- Find compositions of two functions.
- Identify functions that are inverses by using composition of functions.

The Composition of Two Functions

$$(f \circ g)(x) = \underline{f(g(x))}$$

The symbol \circ is used for the composition of two functions.

$(f \circ g)(x)$ and $f(g(x))$ are both read "**f of g of x**".

1 Evaluate $(f \circ g)(4)$ and $(g \circ f)(4)$.

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

$$g(x) = 5x$$

$$(f \circ g)(4) = \underline{27}$$

$$(g \circ f)(4) = \underline{55}$$

2 Evaluate $f(g(4))$ and $g(f(4))$.

$$f(x) = 3x$$

$$g(x) = 3x$$

$$f(g(4)) = \underline{36}$$

$$g(f(4)) = \underline{36}$$

3 Evaluate $f(g(9))$ and $g(f(9))$.

$$f(x) = \sqrt{x}$$

$$g(x) = x^2$$

$$f(g(9)) = \underline{9}$$

$$g(f(9)) = \underline{9}$$

- 4 Find $(f \circ g)(x)$ and $(g \circ f)(x)$.

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

$$g(x) = 5x$$

$$(f \circ g)(x) = \underline{5x + 7}$$

$$(g \circ f)(x) = \underline{5x + 35}$$

- 5 Find $f(g(x))$ and $g(f(x))$.

$$f(x) = \sqrt{x}$$

$$g(x) = x^2$$

$$f(g(x)) = \underline{x}$$

$$g(f(x)) = \underline{x}$$

Two functions f and g are called **inverse** _____ functions, if and only if,

$$f(g(x)) = x \text{ for all } x \text{ in the domain of } g$$

and

$$g(f(x)) = x \text{ for all } x \text{ in the domain of } f.$$

- 6 Determine if the following two functions are inverses of each other.

$$f(x) = 2x$$

$$g(x) = \frac{x}{2}$$

The functions are inverses of each other because

$$\underline{f(g(x)) = x \text{ and } g(f(x)) = x.}$$