

## 10.1 Evaluating and Composition of Functions

Objective: I can evaluate functions for a given value.

Objective: I can create new functions using composition.

### Evaluate

$$f(x) = 3x - 7 \text{ for } x = 4$$

$$g(t) = 5 - t \text{ for } t = -2$$

$$h(x) = \frac{x}{2} + 3 \text{ for } x = 6$$

What if you plug in an expression instead of a number?

Example: Evaluate  $f(x) = 2x - 8$  for  $t + 2$

## COMPOSITION TASK

## Composition of Functions

When you plug a function into a second function, you are doing *composition of functions*.

$$f(g(x)) = (f \circ g)(x) \quad \text{Plug } g(x) \text{ into } f(x)$$

$$g(f(x)) = (g \circ f)(x) \quad \text{Plug } f(x) \text{ into } g(x)$$

**ALWAYS** work from the **INSIDE** to the **OUTSIDE**!

Example: Find  $f(g(x))$  and  $g(f(x))$ .

$$f(x) = 4x - 1 \qquad g(x) = 5 + 2x$$

Example: Find  $(f \circ g)(x)$  and  $(g \circ f)(x)$ .

$$f(x) = \frac{x}{3} - 1 \qquad g(x) = 3x + 6$$

Evaluate.

$$f(x) = x^2 - 1 \qquad g(x) = 2x$$

$$f(g(2))$$

$$(f \circ g)(-1)$$

$$g(f(-3))$$

$$(g \circ f)(0)$$