

# MA 109: August 31

Composition of Functions

Start of Class

Instructor Information

Name:

Email:

Office Hours:

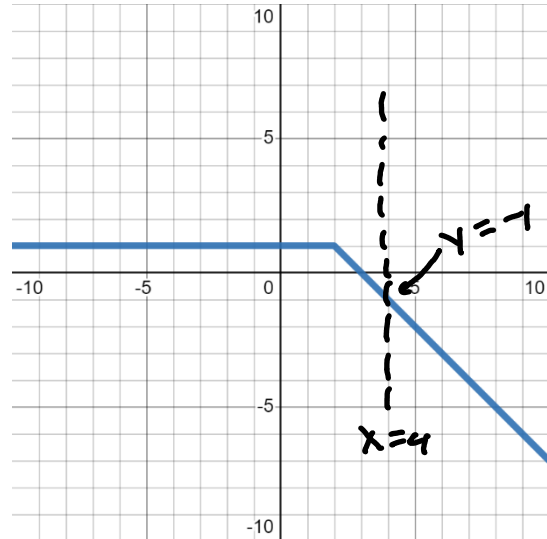
Warm-up Questions

## Notes

input for  $f$  is  
 $\downarrow$   
 $g(4)$

Example: Suppose  $f(x) = x^2 - 7$  and  $g(x)$  is given in the graph below. What is  $f(g(4))$ ?

Strategy: evaluate the inside function first, then plug that into the outside function:



①  $g(4)$

$\uparrow$   
4 is the input, so it is  
the x-value

$$g(4) = -1$$

②  $f(\underline{g(4)}) = f(\underline{-1}) = (-1)^2 - 7 = 1 - 7 = \boxed{-6}$

Example: Suppose  $f(x) = x^2 + 7$  and  $g(x) = 3 - x$ . What is  $f(g(x))$ ?

the input to  $f$  is  $g(x)$

Since there is no input number for the inside function, we will plug the entire formula into the outside function:

$$f(g(x)) = f(3-x) = (3-x)^2 + 7$$

do not simplify unless you are told to do so

Note: The parentheses are essential:

$(3-x)^2 + 7$  is NOT the same as  $3-x^2 + 7$

## End of Class

Write a summary of what you learned today:

What questions do you have about the material from today?

What do you need to do between now and the next class meeting?