

Quiz 7 Today!

Review Horizontal + Vertical translations  
+ reflections

#1 on board

Describe how to obtain the graphs of the following functions from the graph of  $f(x)$

a)  $y = f(x-4)$

b)  $y = -f(-x)$

c)  $f(x) + 9$

~~e) h~~ d)  $y = f(x+2) - 5$

Do #2 a, b, c, d (not d!) we will do that together)

Defn: let  $f(x)$  be a function. ~~the~~ and  $a$  any nonzero number

Then, the graph of  $y = af(x)$  is

1) stretched vertically by a factor of  $|a|$  if  $|a| > 1$

2) compressed vertically by a factor of  $\frac{1}{|a|}$  if  $0 < |a| < 1$

3) if  $a < 0$  we say  $f$  is reflected about  $x$ -axis

Ex: let  $g(x) = 4^x + 2$ . Find an explicit formula

for the following, and describe what their graphs look like.

a)  $\frac{1}{4}g(x)$   
 $= \frac{1}{4}(4^x + 2)$

$g(x)$  compressed vertically by a factor of  $\frac{1}{4}$ .

b)  $-g(x)$   
 $= -(4^x + 2)$

$g(x)$  is reflected across  $x$  and  $y$ -axis.

$$c) \quad 2g(x-5) \\ 2(4^{x-5} + 2)$$

$g(x)$  horizontally shifted by 5 to the  $\textcircled{2}$   
right then stretched by a factor of  
2.