

# Function Transformation

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# ANSWERS to HWK

9)  $f$  is a function because  
passes the vertical line test

10) domain( $f$ )

$$= \{x \mid x \neq -1, 1\}$$

11) range( $f$ ) =  $(-\infty, 4]$

12) x-intercepts at  $x = -6, 2$

13) y-intercept at  $y = 3$

14)  $f$  inc at  $(-\infty, -2)$

15)  $f$  dec at  $(-2, \infty)$

16) rel. max of  $f$  at  $x = -2$ .

17) rel. max of  $f$  is  $y = 4$ .

18)  $f(-4) = 3$

19)  $f(x) = -2$  at  $x = -7, 3$

20)  $f(x) = 0$  at  $x = -6, 2$

21)  $f(x) > 0$  for  $x$  in  $(-6, 2)$ .

# Horizontal Translation

Graph and label the following line on your white board: (make it dotted)

$$A: y = 2x$$

YOU HAVE 30 seconds.

Don't erase anything.

# Horizontal Translation

Add the graph of the solid line on your white board:

$$A: y = 2x$$

$$B: y = 2(x - 1)$$

You have 50 seconds.

Don't erase.

# Horizontal Translation

Add the graph of the dashed line on your white board:

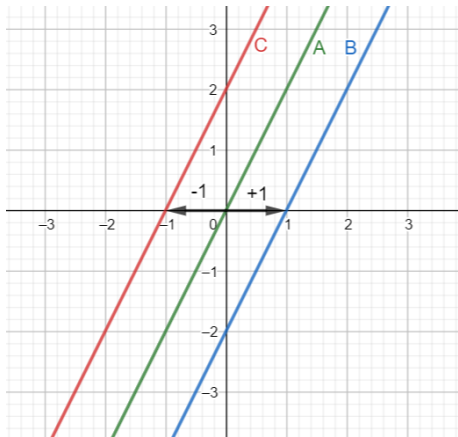
A:  $y = 2x$

B:  $y = 2(x - 1)$

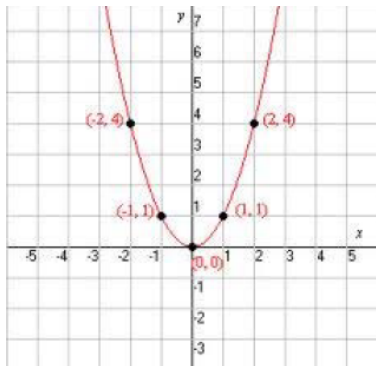
C:  $y = 2(x + 1)$

Don't erase.

Describe the relationship between lines A, B, and C in terms of horizontal translations.

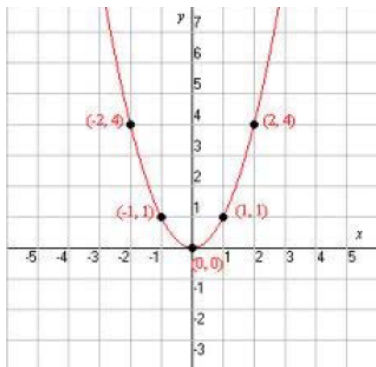


Name the function whose graph is shown below:





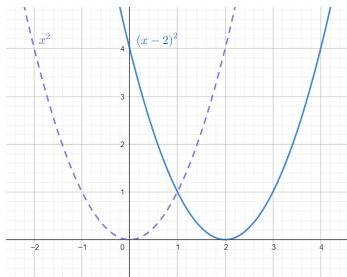
This is the graph of  $f(x) = x^2$



Graph  $(x - 2)^2$ .

If you are unsure, plug in some points and plot them.

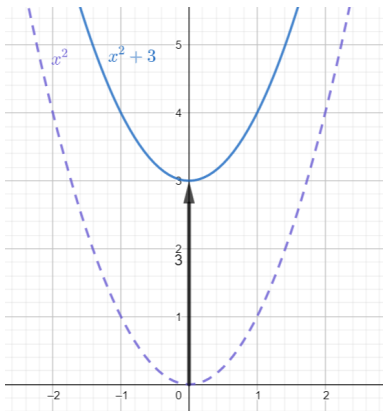
The graph of  $(x - 2)^2$  with the graph of  $x^2$ .



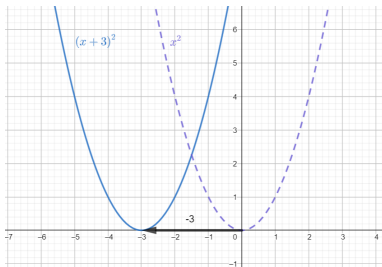
Graph  $x^2 + 3$ .

If you are unsure, plug in some points and plot them.

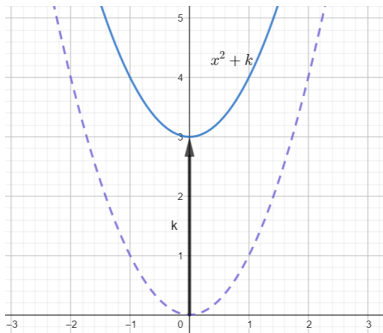
The graph of  $x^2 + 3$  with the graph of  $x^2$ .



The graph of  $(x - h)^2$  is the graph of  $x^2$  translated horizontally by  $h$  units.

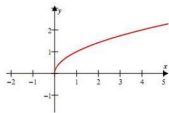


The graph of  $x^2 + k$  is the graph of  $x^2$  translated vertically by  $k$  units.



Here are some of the graphs of common functions:

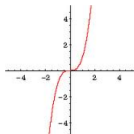
$$f(x) = \sqrt{x}$$



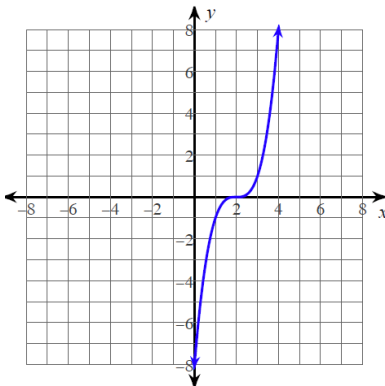
$$f(x) = |x|$$



$$f(x) = x^3$$



Is the graph below a translation of  $x^3$ ,  $x^2$ ,  $\sqrt{x}$ , or  $|x|$ ?



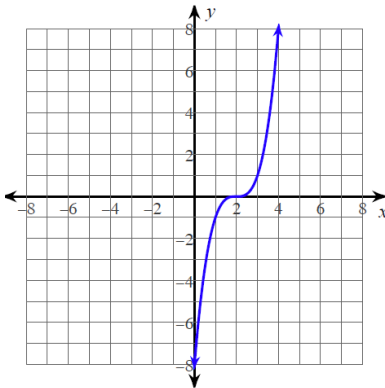
Which direction is it translated?

How many units?

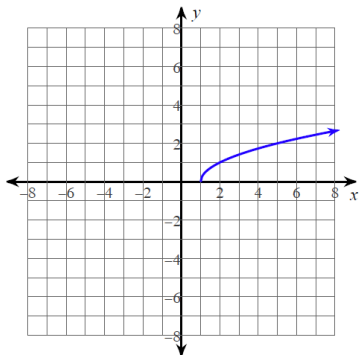
(make sure to use positive or negative)



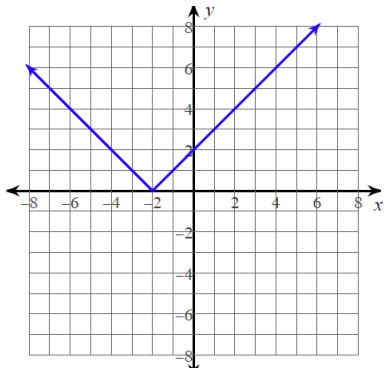
So the graph below is of the form  $(x - \underline{\hspace{2cm}})^3$



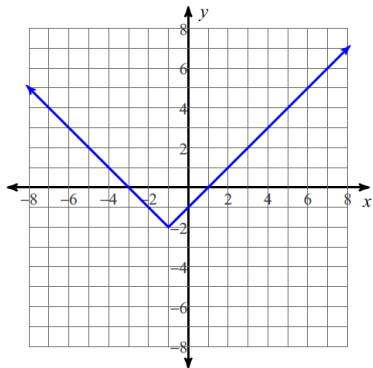
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