

# ABSOLUTE VALUE FUNCTION

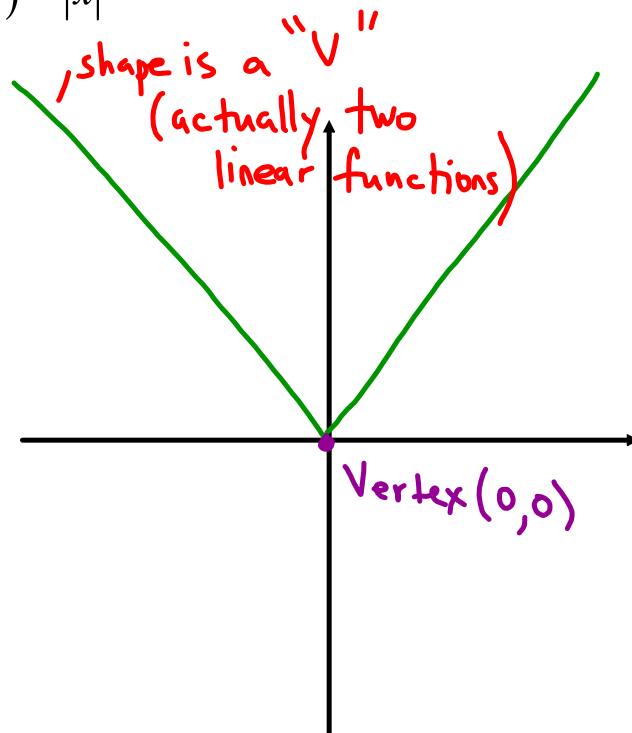
Goal:

- to understand the role of the parameters on the graph of an absolute value function
- to write the rule of an absolute value function in standard form

Homework: p.53 #1,2,5,8

Graph the function  $f(x) = |x|$

$x$	$f(x)$
-10	10
-5	5
0	0
5	5
10	10



The standard form for a transformed absolute value function is:

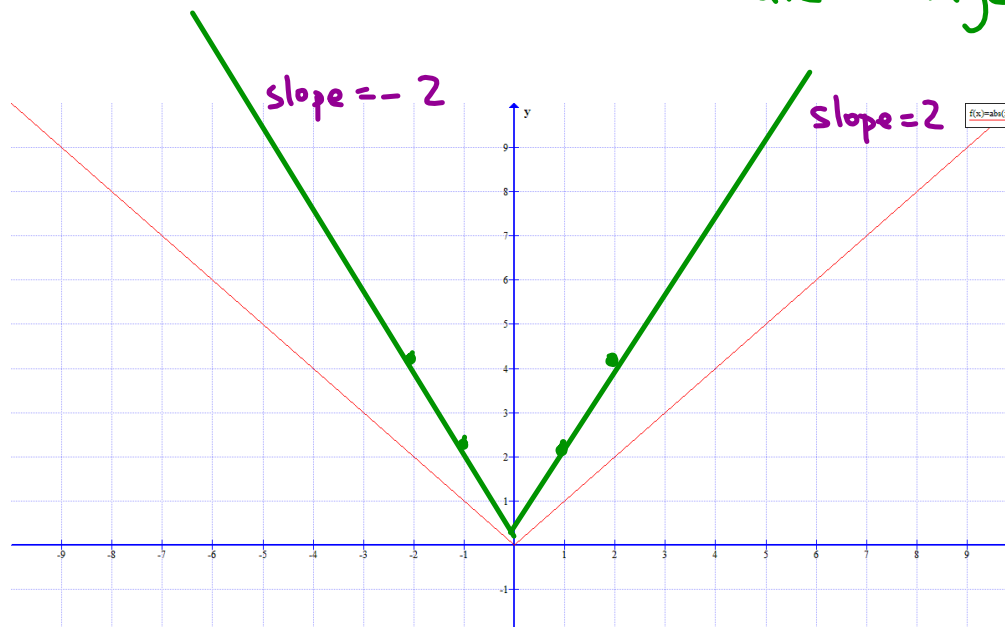
$$f(x) = a|x-h| + k$$

The role of parameters  $a$ ,  $h$  and  $k$  are the same as with other functions.

what affect on the graph will the parameters have?

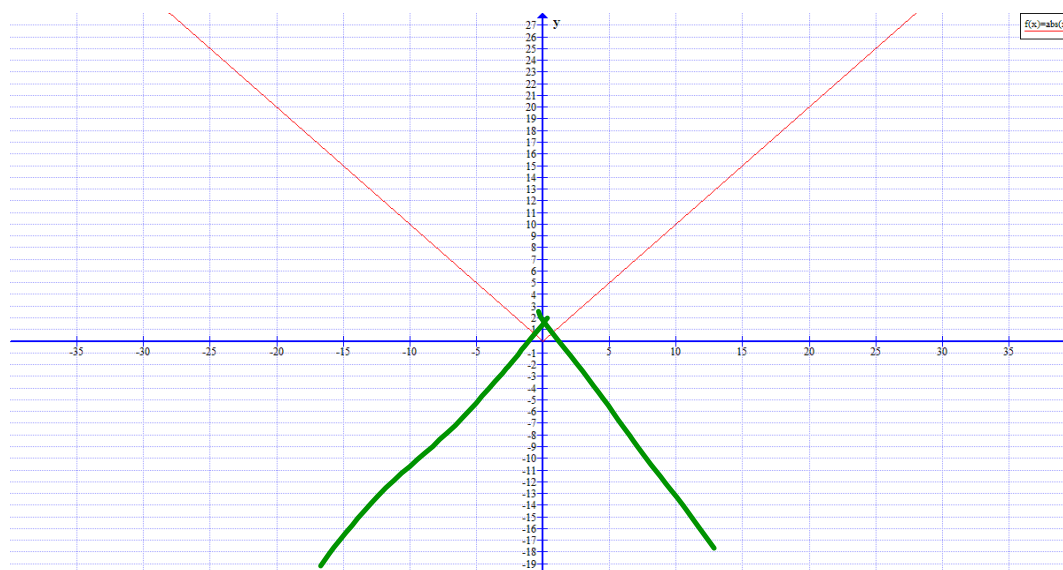
Below is the graph of  $f(x) = |x|$  what would  $f(x) = 2|x|$  look like?

"a" causes vertical  
Scale change



what about  $f(x) = -|x|$  ?

since  $a < 0$  there is a vertical reflection

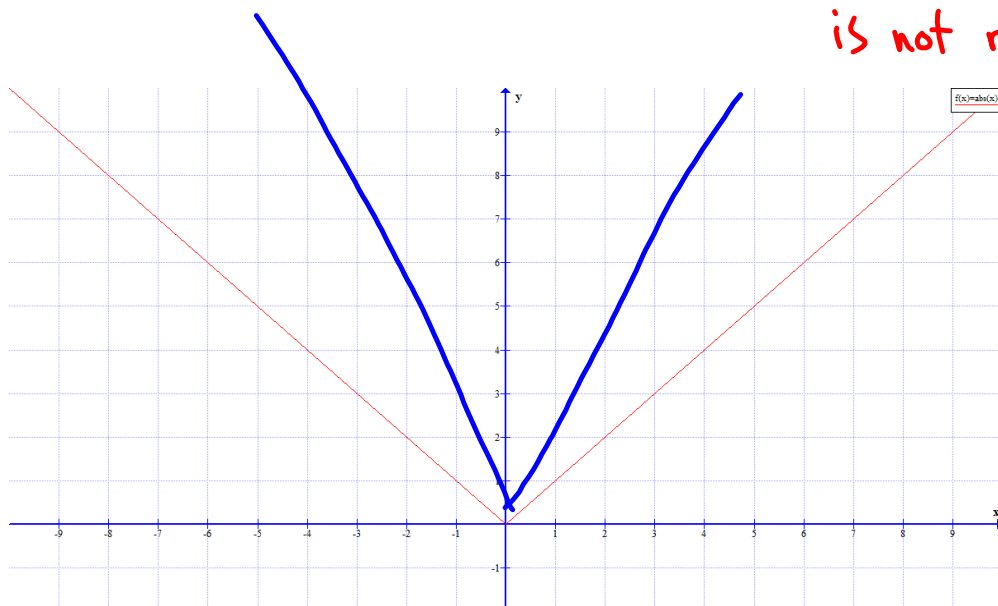


what will the graph of  $f(x) = |2x|$  look like?

$$= |2||x|$$

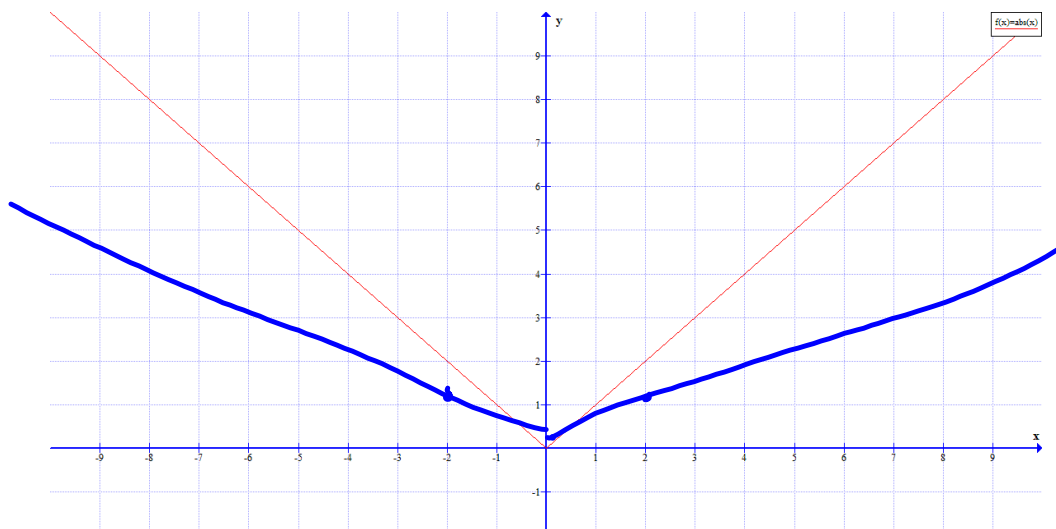
$$= 2|x|$$

there is no "b"  
in the standard  
form since it  
is not required



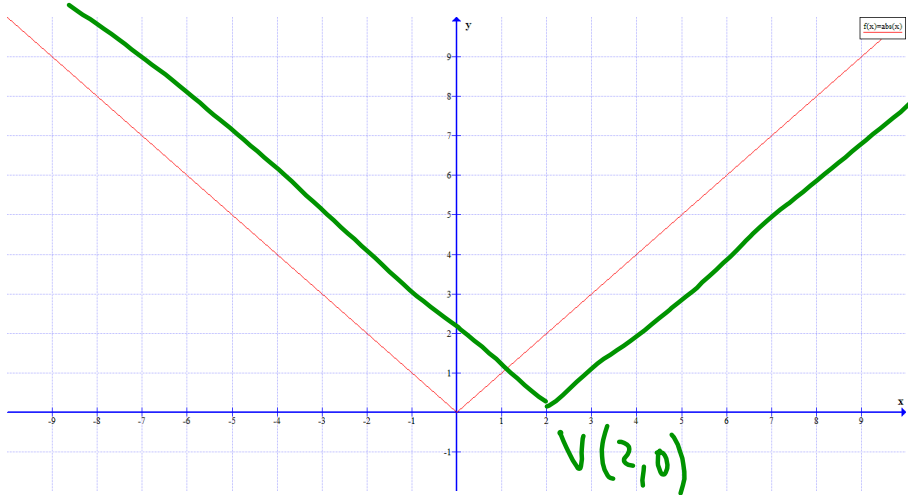
$$f(x) = \left| -\frac{1}{2}x \right|$$

$$= \left| -\frac{1}{2} \right| |x| = \frac{1}{2}|x|$$



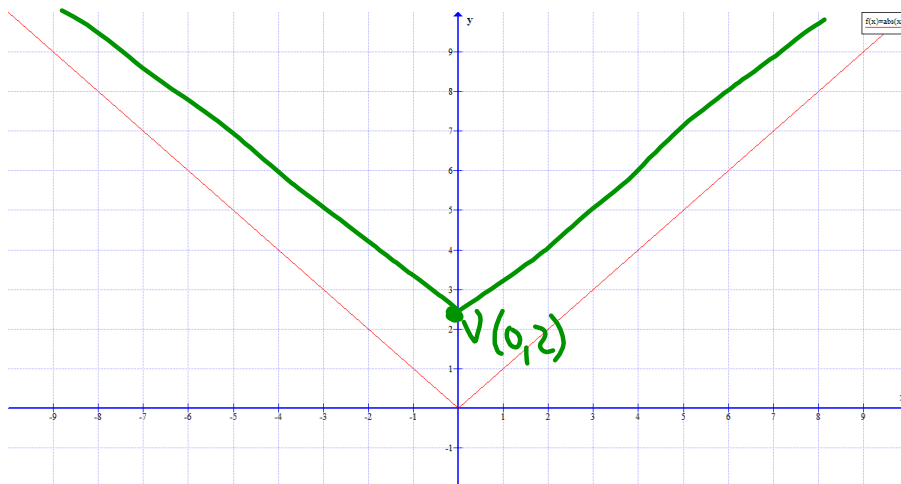
$$f(x) = |x - 2|$$

parameter "h" causes horizontal translation



$$f(x) = |x| + 2$$

parameter "k" causes vertical translation



Sketch the function  $f(x) = -|2x - 4| + 2$

$$\begin{aligned} f(x) &= -|2(x-2)| + 2 \\ &= -|2||x-2| + 2 \\ &= -2|x-2| + 2 \end{aligned}$$

