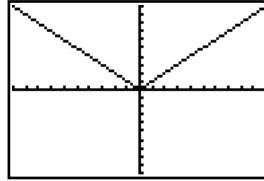


Graphing Absolute Functions (2.5/2.6)

All Absolute value functions are based on the “parent” absolute function.

The basic absolute value graph looks like:



The table of values for an absolute value function looks like :

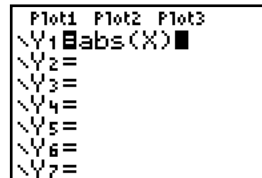
X	Y1	
1	1	
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9	9	
10	10	

We would expect you to be able to graph $y = |x|$ by using a table on the test. We would also expect you to graph (without a calculator) the graph of $y = -2|x + 3| - 5$ on the test!

Here’s what you need to know:

Enter **y = abs(x)** into the y1 of your y= button

Note: The absolute value feature is found in MATH NUM 1:abs(



We will call y1 the parent function.

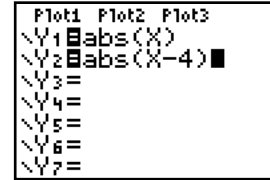
We would suggest you press **ZOOM 6:Standard** to get a nice window.

Today your goal is to learn about the vertex form of an absolute value function, which looks like: $y = a|x - h| + k$. One of the *letters* shifts the parent function graph left or right. One of the *letters* shifts the graph up or down. One of the *letters* widens or narrows the graph and can even flip it upside down. You will be learning about the effects of “a” “h” and “k” of the function $y = a|x - h| + k$. These are also known as the transformations.

First is the “h”

Leave your parent function $y = |x|$ in y1 for the entire activity!

Change the y2 to be: $y2 = |x - 4|$ Sketch what the graph looks like:



Now change y2 to be:

$$y2 = |x - 2|$$

$$y2 = |x + 3|$$

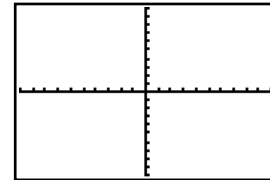
$$y2 = |x - (-3)|$$

$$y2 = |x + 2|$$

$$y2 = |x - 8|$$

$$y2 = |x - 0|$$

$$y2 = |x - (1/2)|$$

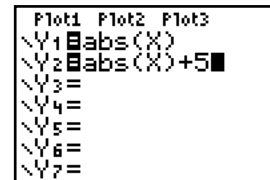


Describe how “h” transforms the parent graph:

Second is the “k”

Leave your parent function $y = |x|$ in y1 for the entire activity!

Change the y2 to be: $y2 = |x| + 5$ Sketch what the graph looks like:



Now change y2 to be:

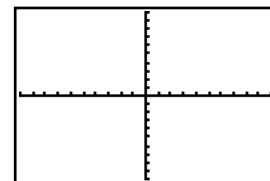
$$y2 = |x| + 2$$

$$y2 = |x| - 2$$

$$y2 = |x| - 8$$

$$y2 = |x| + 0$$

$$y2 = |x| + 6.5$$



Describe how “k” transforms the parent graph:

Third is the “a”

Leave your parent function $y = |x|$ in y1 for the entire activity!

Change the y2 to be: $y2 = 2|x|$ Sketch what the graph looks like:

```
Plot1 Plot2 Plot3
Y1=abs(X)
Y2=2abs(X)
Y3=
Y4=
Y5=
Y6=
Y7=
```

Now change y2 to be:

$$y2 = 3|x|$$

$$y2 = 5|x|$$

$$y2 = \frac{1}{2}|x|, \text{ use } (1/2)$$

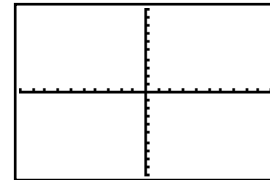
$$y2 = \frac{1}{5}|x|$$

$$y2 = 1|x|$$

$$y2 = -1|x|$$

$$y2 = -3|x|$$

$$y2 = 10|x|$$

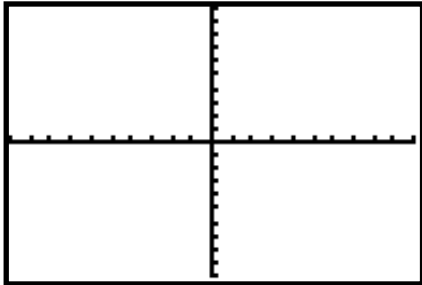


Describe how “a” transforms the parent graph:

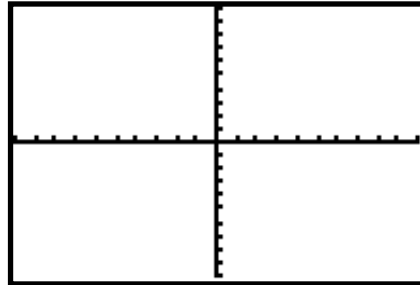
Now do the back:

Do first without your calc! (Then check using your calc)

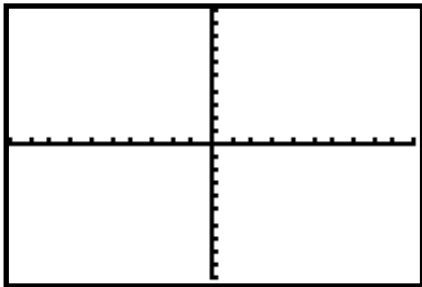
1. $y = |x - 6| + 2$



2. $y = -|x| - 3$



3. $y = 2|x + 3|$



4. $y = -\frac{1}{3}|x - 4| + 4$

