**Algebra 2**
*Transformations Take 2*

Go to the class moodle site. Under "Week 7" there is a heading for applets, click the link. It should open a page with a graph and some other bits.

This applet will allow you to explore transformations at your own pace. The sliders adjust the parameters of the function such that:

$$g(x) = af(b(x - c)) + d$$

Where $f(x)$ is the original function shown in red and $g(x)$ is the transformed function shown in blue. The check boxes also do transformations, but we'll get there in due time.

You may enter a new function by typing in the input bar at the bottom. Note: the new function must be $f(x)$ in order for the transformations to work. If you get things too messed up or just want to start over press the reset button in the top right 🔄 .
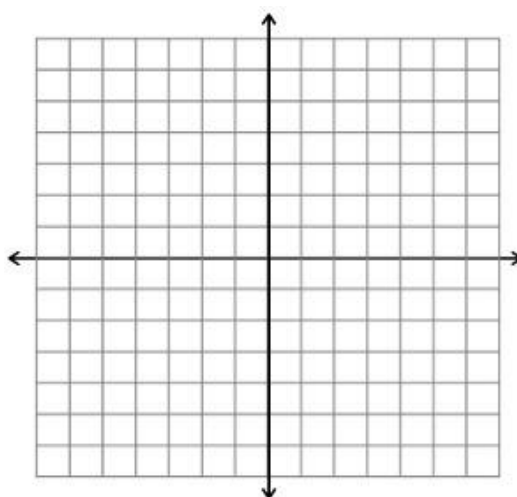
## Part 1

**Adjusting the *a* value.**

Using the slider adjust the value of *a*. Try small values of *a* and large values of *a*. On the axes below sketch a examples of the function for different values of *a* and abel each graph with the value of *a*.

What happens to the graph of the function as *a* gets larger?

As *a* gets smaller?

When *a* goes to zero what happens? Why?

Write a general rule to describe how *a* affects the shape of the graph.

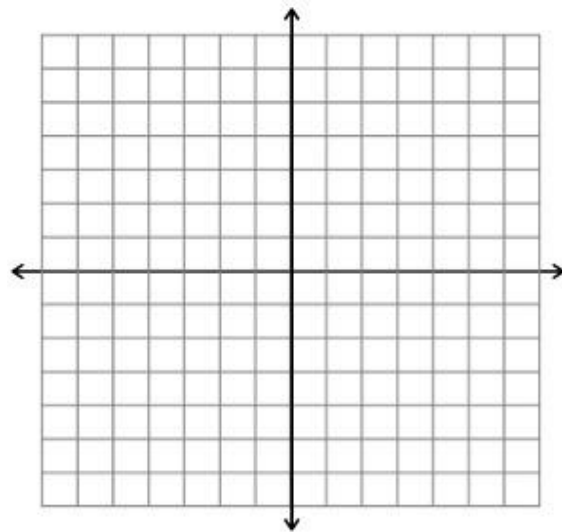Input a new function. Does the behavior still obey your general rule?
**Adjusting the *b* value.**

Using the slider adjust the value of *b*. Try small values of *b* and large values of *b*. On the axes below sketch a examples of the function for different values of *b* and label each graph with the value of *b*.

What happens to the graph of the function as *b* gets larger?

As *b* gets smaller?

When *b* goes to zero what happens? Why?

Write a general rule to describe how *b* affects the shape of the graph.

Input a new function. Does the behavior still obey your general rule?

**Adjusting the *c* value.**

Using the slider adjust the value of *c*. Try small values of *c* and large values of *c*. On the axes below sketch a examples of the function for different values of *c* and label each graph with the value of *c*.

What happens to the graph of the function as *c* gets more and more positive?

As *c* gets more and more negative?

Write a general rule to describe how *c* affects the shape of the graph.

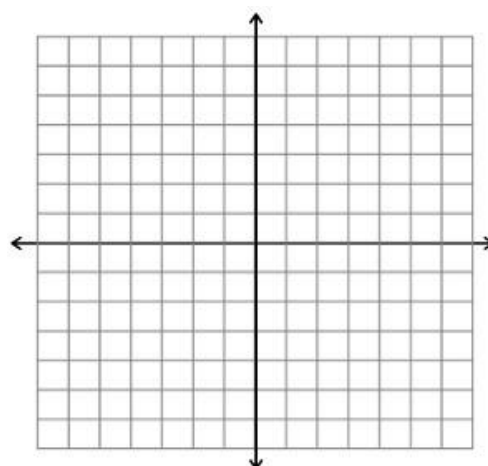Input a new function. Does the behavior still obey your general rule?

**Adjusting the *d* value.**

Using the slider adjust the value of *d*. Try small values of *d* and large values of *d*. On the axes below sketch a examples of the function for different values of *d* and label each graph with the value of *d*.

What happens to the graph of the function as *d* gets more and more positive?

As *d* gets more and more negative?

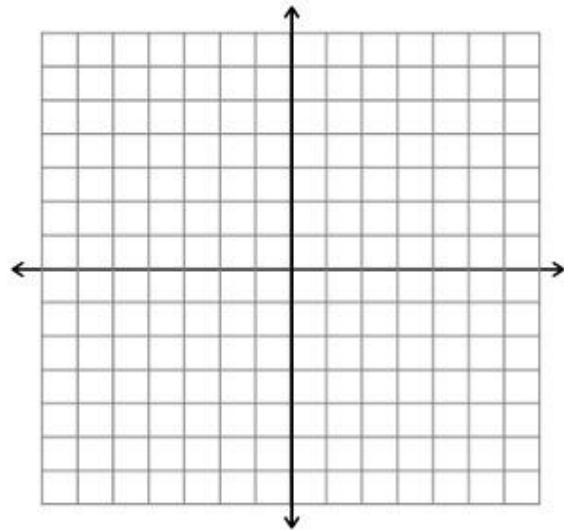Write a general rule to describe how d affects the shape of the graph.

Input a new function. Does the behavior still obey your general rule?

## Part 2

The four check boxes on the right each transform the function in a different way. Checking a box will create a 3rd graph (green) that shows the transformation from the blue line.

- $f(x) \rightarrow -f(x)$
- $f(x) \rightarrow f(-x)$
- $f(x) \rightarrow f(|x|)$
- $f(x) \rightarrow |f(x)|$

For each transformation explore what it does to the graph, you may need to play with the sliders to fully explore what each check box does. For each transformation describe what it does to the function.

| Transformation | Description |
|---|---|
| $f(x) \rightarrow -f(x)$ | |
| $f(x) \rightarrow f(-x)$ | |
| $f(x) \rightarrow f(|x|)$ | |
| $f(x) \rightarrow |f(x)|$ | |

Creating Functions - Using the transformation applet create functions that match the descriptions below. For each make a quick sketch of the function and write down the equation for the function.