

## Using Geogebra to investigate function transformations.

### Horizontal and Vertical Shifts

1. Create two sliders and name them a and b.
2. On the input bar, enter the function  $(x + a)^2 + b$ .
3. Move the slider and write a conjecture about how the values of a and b effect the graph.

$$f(x+a)+b$$

### Vertical Shrink and Stretch

1. Create one slider a and make the minimum value 0.
2. Enter the function  $a|x|$ .
3. Move the slider and write a conjecture about how the value of a effects the graph.

$$a f(x)$$

### Reflections

1. Create a slider a and make the minimum value -1 and the maximum value 1. Then make the increment 2.
2. Enter the function  $a(\sqrt{x})$ .
3. Move the slider and comment on the value of a and how it effects the graph.
4. Now graph  $(ax^3)$ .
5. Move the slider and comment on the value of a and how it effects the graph.

$$-f(x)$$

$$f(-x)$$