

Algebra 2A
2-6 Families of Functions

Name: _____

Date: _____ Hr: _____

Objective:

- To analyze transformations of functions

Common Core Content Standard:

- F.BF.3 Identify the effect on the graph of replacing $f(x)$ by $f(x) + a$, $af(x)$, $f(ax)$, and $f(x + a)$ for the specific values of a (both positive and negative) find the value of a given the graphs.

Shifts, stretches, shrinks, and reflections are called _____. many graphs of functions can be created from a combination of these.

Vertical and Horizontal Shifts

Let a be a positive real number. Vertical and horizontal shifts in the graph of $y = f(x)$ are represented as follows.

1. Vertical shift a units _____ :
 $h(x) = f(x) + a$
2. Vertical shift a units _____ :
 $h(x) = f(x) - a$
3. Horizontal shift a units to the _____ :
 $h(x) = f(x - a)$
4. Horizontal shift a units to the _____ :
 $h(x) = f(x + a)$

Reflections

1. Reflection in the x -axis
 $h(x) = -f(x)$
2. Reflection in the y -axis
 $h(x) = f(-x)$

Stretches and Compressions

1. Vertical stretch (if $a > 1$)
 $h(x) = af(x)$
2. Vertical shrink (if $0 < a < 1$)
 $h(x) = af(x)$
3. Horizontal shrink (if $a > 1$)
 $h(x) = f(ax)$
4. Horizontal stretch (if $0 < a < 1$)
 $h(x) = f(ax)$