More on Functions

Transformations

Given parent function f(x),

* f(x +a) horizontally shifts a spaces to the left
* f(x – a) horizontally shifts a spaces to the right
* f(x) +a horizontally shifts a spaces up
* f(x) – a horizontally shifts a spaces down
* f(-x) reflects across the y-axis
* – f(x) reflects across the x-axis
* c f(x) stretches the graph vertically by a factor of c (example: 2f(x) is twice as tall)
* f(cx) compresses the graph horizontally by a factor of c (ex. f(2x) is half as wide)

Horizontal transformations are the opposite of what common sense tells you.

With combinations of horizontal transformations, deal with add/subt (shifts), then multiplication (stretch/flips).

Examples: Graph the following:

1.

2.

3.

4.

5.

6.

Inverse functions

To find the inverse of switch x and y, then solve for y.

Examples: Find each inverse and compare the graphs of

1. 2.

Composition

or , combining two functions to get a new function

Examples: Given and ,

find and then find and

Try: Given and , find and

The domain of the composition is the intersection of the inner function’s domain and the composition’s domain.

Example: and . Find and its domain.

Try: and . Find and its domain.