3.6 Transformations of Graphs of Linear Functions

Class Discussion: What does it mean to be a family?

Family of functions: a group of functions with similar characteristics.

Parent Function: The most basic function in a family of functions.

What is the linear parent function?

What is a Transformation?

A Transformation is a change in size, shape, position, or orientation of a graph.

Translation: a shift (or slide) of a graph horizontally or vertically, but does not change the size, shape or orientation.

Horizontal Translations

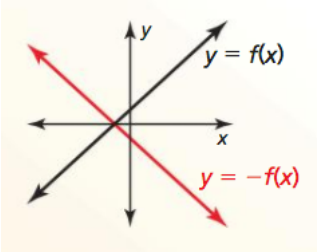
Vertical Translations

Combined horizontal & Vertical

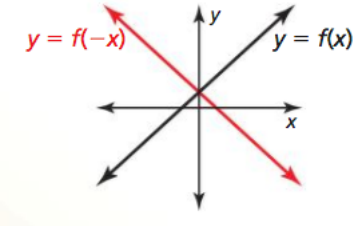
What does it mean to **reflect** something?

Reflection: a transformation that flips a graph over a *line of reflection.*

Reflection over x-axis



Reflection over y-axis



Practice:

Graph $f(x) = x$ and $g(x) = -2x + 3$. Describe the transformations from the graph of f to the graph of g.

In Exercises 35–38, write a function g in terms of f so that the statement is true.

35. The graph of g is a horizontal translation 2 units right of the graph of f.

36. The graph of g is a reflection in the y-axis of the graph of f.

37. The graph of g is a vertical stretch by a factor of 4 of the graph of f.

38. The graph of g is a horizontal shrink by a factor of $\frac{1}{5}$ of the graph of f.