Warm-Up

1. Log into student.desmos.com.
2. Solve the activity *Quadratics, Lesson 2, Summative Assessment - Function Families*

Function Families
Algebraic Expressions

Today's Plan

1. Lesson: Connect equations and graphs of functions.
2. Practice: exercises in Desmos or on paper.

(K3.1) Students will know that the equation of any member of a family can be obtained from the equation of the parent function.

(D3.1) Students will be able to describe in natural language the transformations applied to a parent function to obtain a given equation.

(D3.2) Students will be able to determine the equation of a function given a list of transformations.

Function notation

$y = 2x + 3$

$f(x) = 2x + 3$

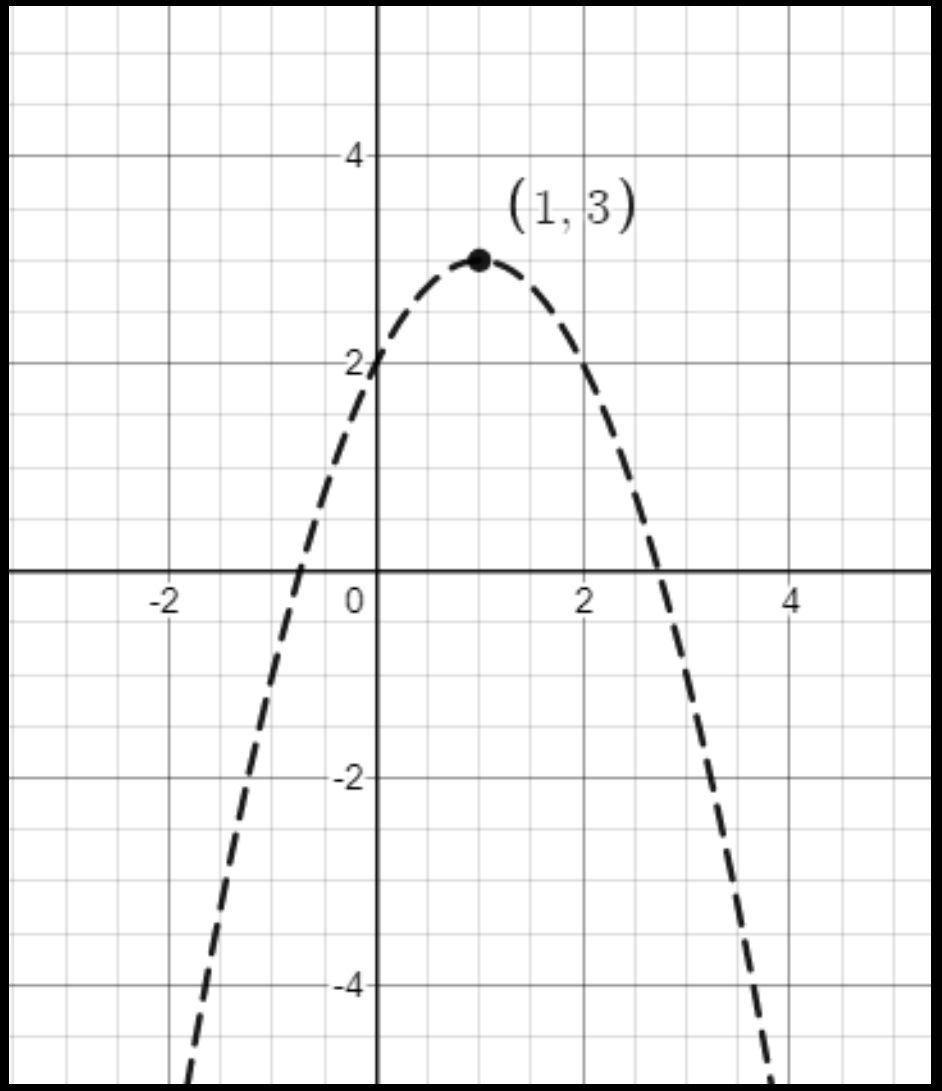
A name for the function.

A name for the variable.

$f(x) = 2x + 3$
$g(x) = 5x + 2$

$f(x) = mx + b$

Reflection over the x-axis

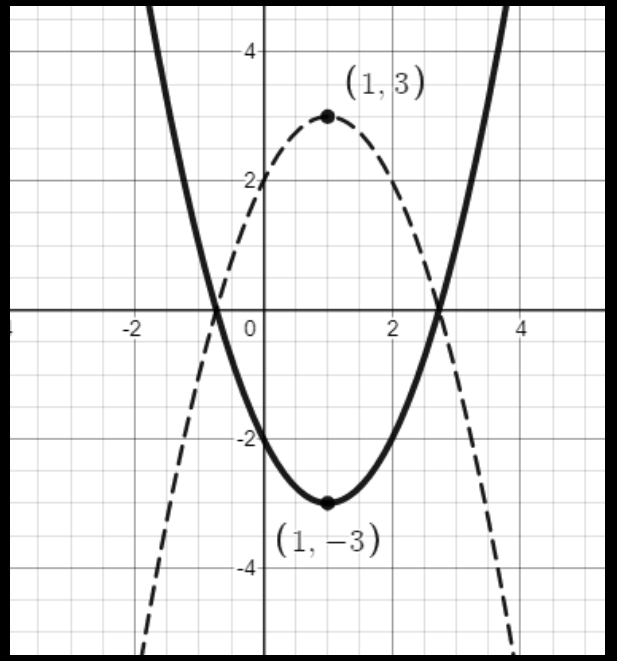


$$f(x) \rightarrow -f(x)$$

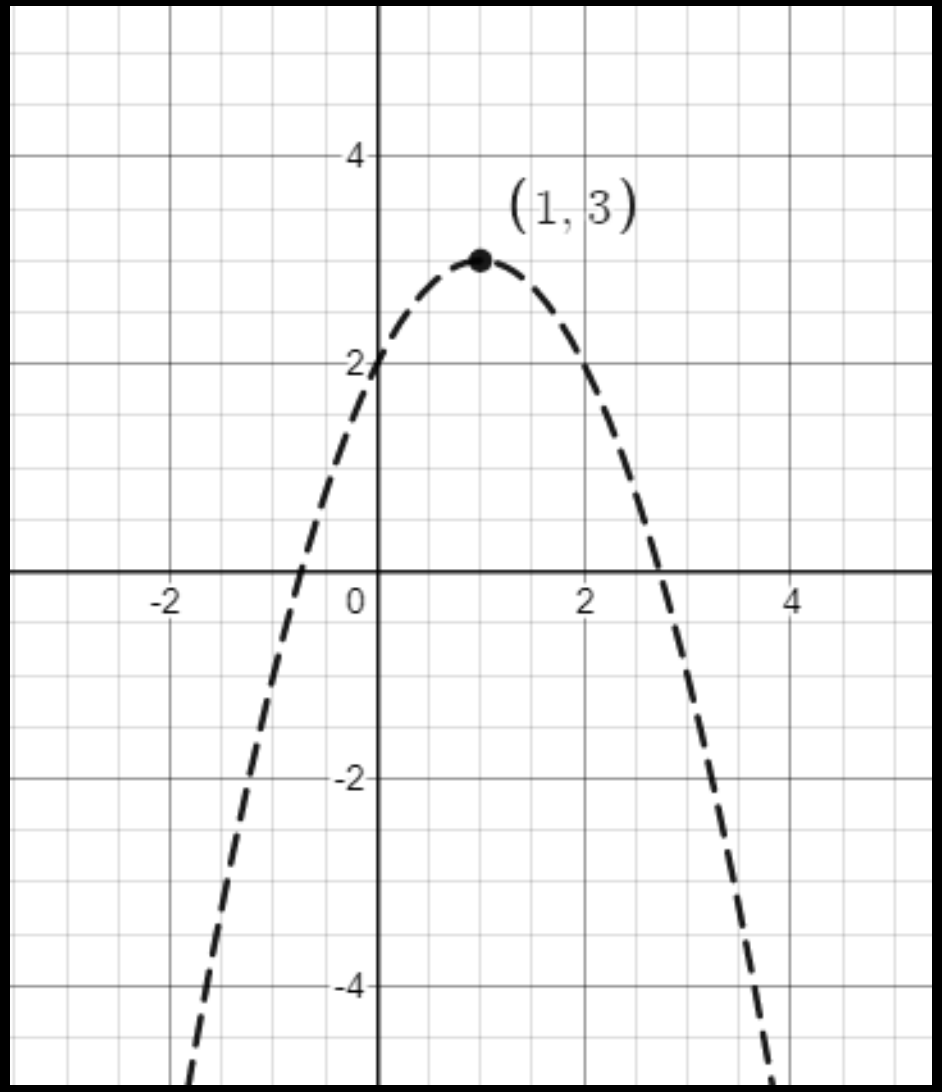
Reflection over the x-axis

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

$f(x) = -x^2 + 2x + 2$ reflected over the x-axis



Right Translation by b units

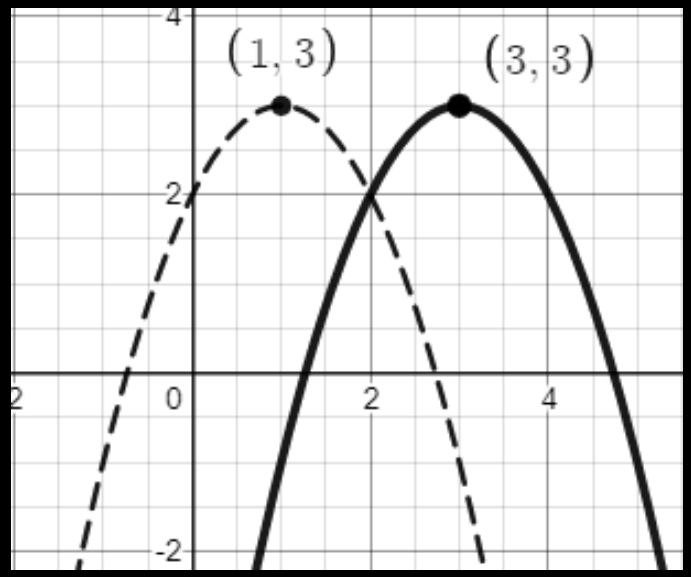


$$f(x) \rightarrow f(x-b), b > 0$$

Right Translation

$$f(x) \rightarrow f(x-b), b > 0$$

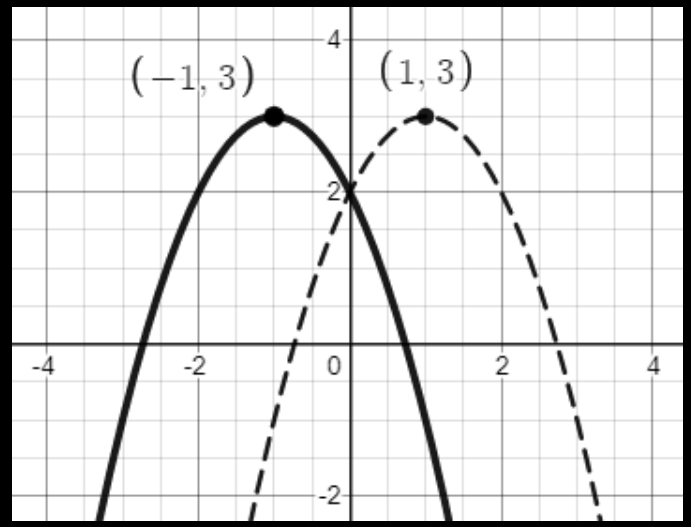
$f(x) = -x^2 + 2x + 2$ moved to the right by 2 units is



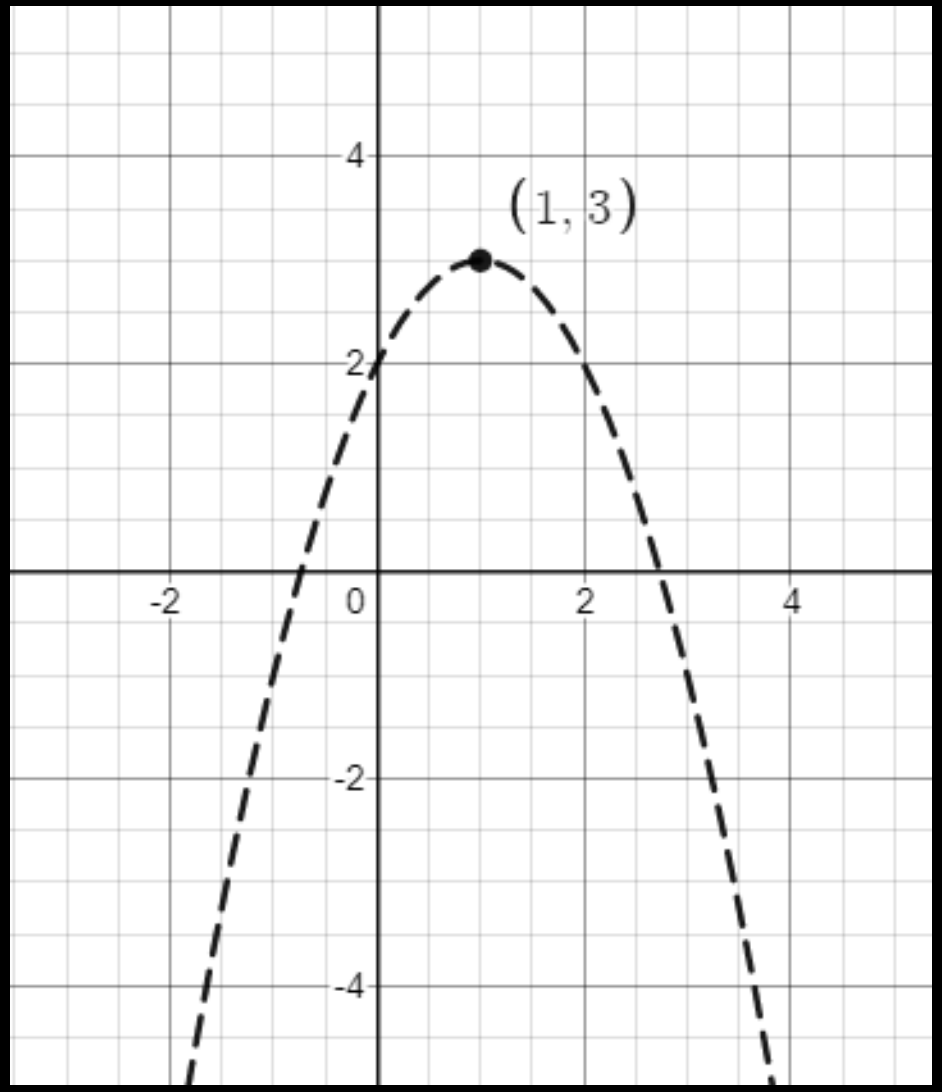
Left Translation

$$f(x) \rightarrow f(x+b), b > 0$$

$f(x) = -x^2 + 2x + 2$ moved to the left by 2 units is



Down Translation

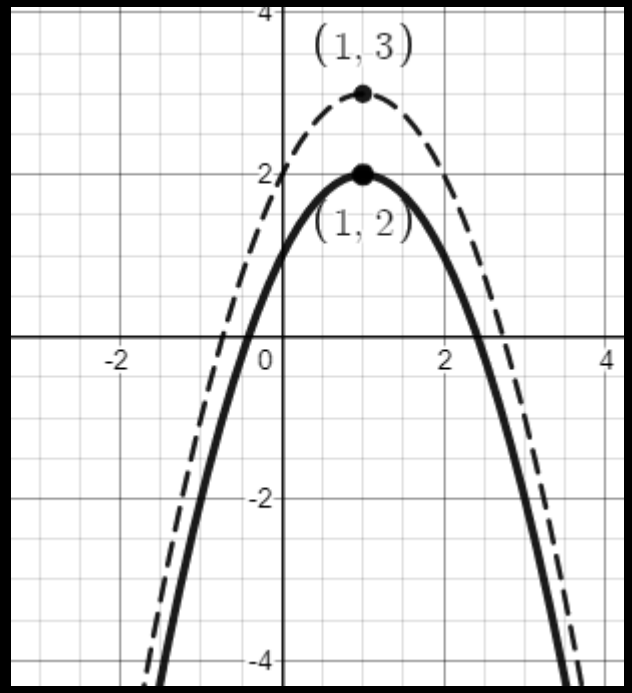


$$f(x) \rightarrow f(x) - a, a > 0$$

Down Translation by a units

$$f(x) \rightarrow f(x) - a, a > 0$$

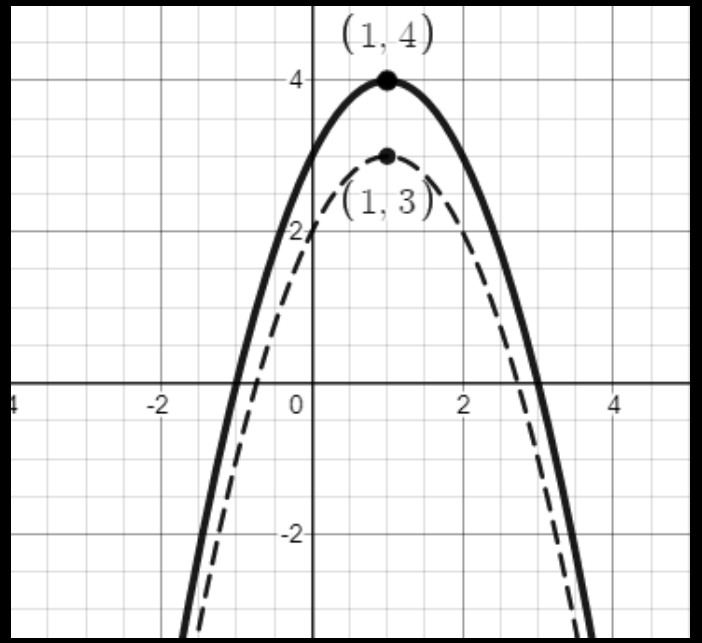
$f(x) = -x^2 + 2x + 2$ moved down 1 unit.



Up Translation

$$f(x) \rightarrow f(x) + a, a > 0$$

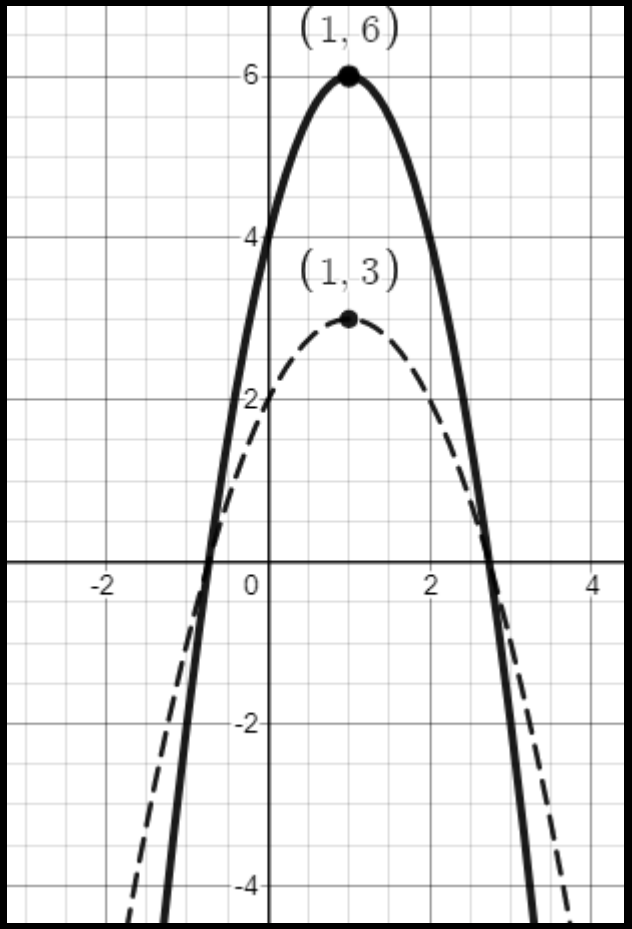
$f(x) = -x^2 + 2x + 2$ moved up 1 unit.



Vertical Stretch

$$f(x) \rightarrow cf(x), c > 1$$

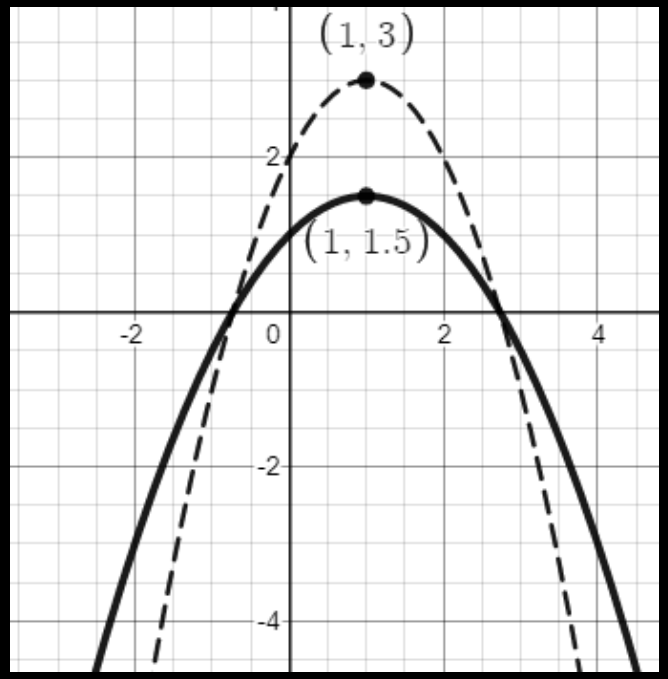
$f(x) = -x^2 + 2x + 2$ stretched by a factor of 2 ($c = 2$).



Vertical Compression

$$f(x) \to cf(x), 0 < c < 1$$

$f(x) = -x^2 + 2x + 2$ stretched by a factor of 2 ($c = \frac{1}{2}$).



1. Log into student.desmos.com.
2. Solve the activity *Quadratics, Lesson 3, Transformations*

Or solve the same problems on paper, in the packet called *Practice.*

Charge

In-class:

Work on the home problems

in Desmos (*Quadratics, Lesson 3, Homework*)

or paper packet.

At-home:

Keep working on the Delta Math assignments.