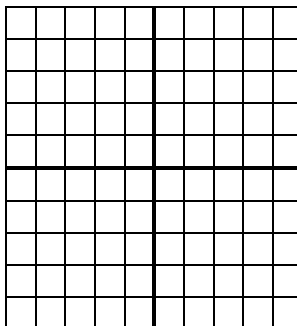


Graphing Quadratic Functions

In Lesson 3.3 we learned how to translate a function. What other types of functions could we translate? Go to Desmos.com and click the start graphing button.

1. Graph $f(x) = x^2$ and fill in the table and graph below.

x	y



2. Where is the lowest point of the graph located?

3. For what value of x does...

$f(x) = 16?$

$f(x) = 9?$

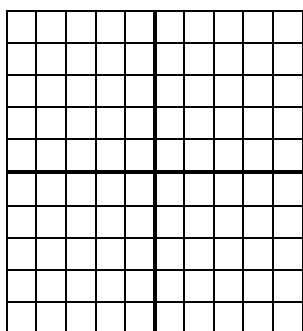
$f(x) = 25?$

$f(x) = 0?$

What do you notice?

4. Use your knowledge from previous lessons to graph each of the following functions **without Desmos**. When you are done, check your graphs in Desmos and describe how the graph has transformed from the parent function, $f(x) = x^2$?

a. $y = (x - 1)^2$

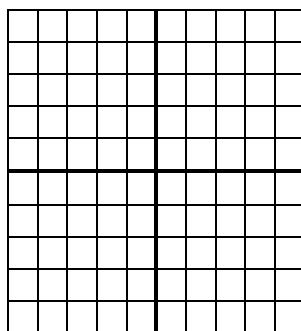


Vertex: _____

Axis of Symmetry: _____

Transformation:

b. $y = x^2 - 4$

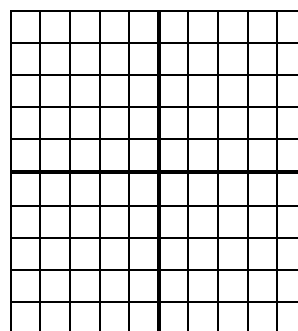


Vertex: _____

Axis of Symmetry: _____

Transformation:

$y = (x - 1)^2 - 4$



Vertex: _____

Axis of Symmetry: _____

Transformation:

Lesson 3.4 – Translations and the Quadratic Family

Important ideas:

Check Your Understanding

1. Describe the translations of the graph of $y = x^2$ needed to produce the graph of each equation.

a. $y = x^2 - 6$

b. $y = (x + 5)^2$

c. $y = (x - 3)^2 - 9$

2. Find the vertex of each parabola.

a. $y = x^2 + 3$

b. $y = (x - 2)^2$

c. $y = -8 + (x + 5)^2$

3. Each parabola described is the graph of $y = x^2$. Write an equation for each parabola and sketch its graph.

a. The parabola is translated horizontally -3 units.

4. Describe what happens to the graph of $y = x^2$ in the following situations.

a. y is replaced with $(y + 1)$.

b. x is replaced with $(x - 5)$.

5. Solve.

a. $x^2 + 6 = 31$

b. $x^2 - 12 = 52$

c. $(x - 3)^2 = 100$