Pre Calc Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 WS Assessment

Target 2

Quadratic function

* Quadratic Functions: The Vertex
* Manipulating Graphs: Shifts and Stretches
* Manipulating Graphs: Symmetry and Reflections

HW 2 Manipulating Graphs [www.deltamath.com](http://www.deltamath.com)

A quadratic function is a 2nd-degree polynomial function:

$ f\left(x\right)=ax^{2}+bx+c $ where $a\ne 0$

Vertex form $f\left(x\right)=a(x-h)^{2}+k$ where the vertex is (h, k) with $h=\frac{-b}{2a}$ and $k=c-\frac{b^{2}}{4a}$

The x-intercepts of the parabola, if there are any, are the solutions (call roots) of the quadratic.

Roots form $f\left(x\right)=a(x-x\_{1})(x-x\_{2})$ where the roots are $x\_{1,2}=\frac{-b\pm \sqrt{b^{2}-4ac}}{2a}$

Find the vertex of the following parabola and rewrite it into vertex form. Show me one for stamp (desmos ok)

$f\left(x\right)=2x^{2}-8x+7$ $g\left(x\right)=2x^{2}+2x+5$ $h\left(x\right)=x^{2}+6x-2$

Without graphing, state if the parabola has maximum or minimum and its location

$f\left(x\right)=x^{2}-6x+2$ $g\left(x\right)=-x^{2}-5x+9$ $h\left(x\right)=-2x^{2}+4x-6$

Write a quadratic function in standard form if its vertex at (-2,3) and pass through point (2, -1)

Now you do: Write a quadratic function in standard form if its vertex at (\_\_\_\_\_, \_\_\_\_\_) and pass through point (\_\_\_\_, \_\_\_\_). Show me its graph for stamp (both forms)

Write a quadratic function in standard form if it has x-intercept at 5 and 1 and y-intercept at 6

Now you do: Write a quadratic function in standard form if it has x-intercept at \_\_\_\_ and \_\_\_\_\_ and y-intercept at \_\_\_\_\_\_\_\_\_\_. Show me its graph for stamp (three forms)

Find a quadratic function f(x) such that f(2) = -20 is it minimum value and such that f(4) = - 8



Show me these graphs for stamp and explain the transformation

Down by \_\_\_\_\_\_\_\_\_\_

Left by \_\_\_\_\_\_\_\_\_\_

And \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Transformation: Given an equation in x and y, the following changes in the equations will transform its graph

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|

|  |  |
| --- | --- |
| Replacing | **Translation** |
| **x** by x – h | **Right h** |
| **x** by x + h | **Left h** |
| **y** by y – k | **Up k** |
| **y** by y + k | **Down k** |

 |

|  |  |
| --- | --- |
| Replacing | **Reflection** |
| **x** by -x | **Over y axis** |
| **y** by -y | **Over x axis** |
| **x** by -x and **y** by -y | **Rotation about origin** |
| **x** by y and **y** by x  | **Over the line y = x** |

 | Replacing * x by ax

 Stretch by a factor* x by 1/a x

 Compress by a factor  |

Find the equation of the graph which is obtained by reflecting the graph y = x3 over the line y = x Graph to check.

Find an equation of the graph which results from reflecting the graph of y = x2 + 5  over the x-axis, and then shifting the resulting graph 3 units up. Graph to check

Find an equation of the graph which results from reflecting the graph of y = ex over the x-axis, and then shifting the resulting graph 3 units up. Graph to check

Now you do. Find an equation of the graph which results from translating the graph $\frac{x^{2}}{9}+\frac{y^{2}}{16}=1$ left 5 units and up 2 units. Show me both for stamp

Find an equation of the graph which results from reflecting the graph of $y=\sqrt{x}$  over the y-axis, and then shifting the resulting graph 3 units up. . Show me both for stamp

Explain how to obtain the graph of y = 9 – ln(5 – x) from the graph of y = ln(x) using translations and reflections. Graph to check

Explain how to obtain the graph of $y=\frac{1}{2-x}$ from the graph of $y=\frac{1}{x}$ using translations and reflections. Graph to check

Explain how to obtain the graph of $y=\frac{x-4}{x-3}$ from the graph of $y=\frac{1}{x}$ using translations and reflections. Graph to check

Explain how to obtain the graph of $y=\frac{2x-4}{x-3}$ from the graph of $y=\frac{1}{x}$ using translations and reflections. Graph to check

Now you do. Explain how to obtain the graph of $y=\frac{x}{x-3}$ from the graph of $y=\frac{1}{x}$ using translations and reflections. Graph to check

**Target 2 Assessment**

Now you do: Write a open down quadratic function in standard form if it has x-intercept at \_\_\_\_ and \_\_\_\_\_ and y-intercept at \_\_\_\_\_\_\_\_\_\_. Show me its graph for stamp (three forms)

Find a quadratic function f(x) such that f(\_\_\_) = \_\_\_\_\_ is it minimum value and such that

f(\_\_\_\_) = \_\_\_\_\_\_\_

Now you do. Find an equation of the graph which results from translating the graph $\frac{x^{2}}{9}+\frac{y^{2}}{16}=1$ left 2 units and up 3 units **then** reflecting over line y = x. Show me for stamp

