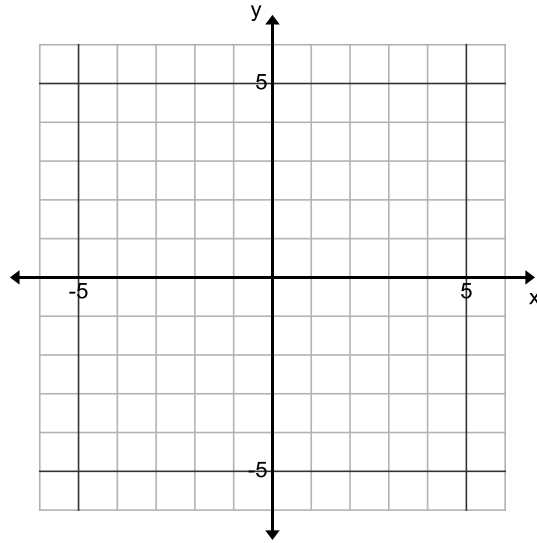


Ch 8: Transformations Notes & Examples Packet

Parent Functions:

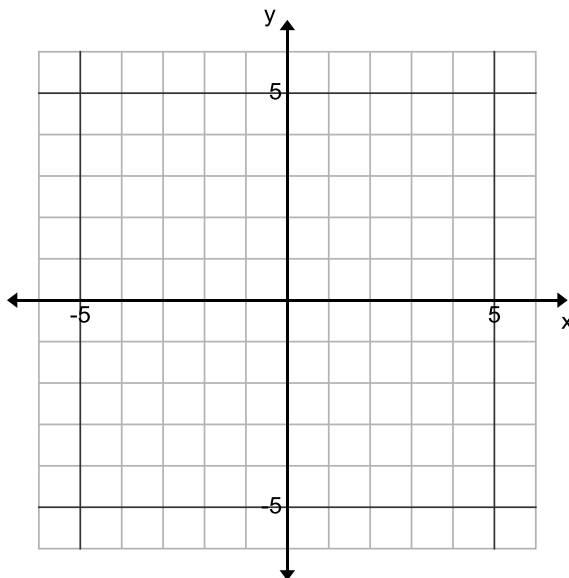
$$f(x) = |x|$$

x	y



$$f(x) = x^2$$

x	y



Definitions

Translation:

Reflection:

Transformation:

All Transformations Note Sheet

$$f(x) = a \cdot |x - h| + k$$

$$g(x) = a \cdot (x - h)^2 + k$$

a:

h:

k:

reflections:

Writing Equations Given Transformations

Parent Function	$y = x^2$	$y = x $	$f(x)$
Translations -Left 2 units -Down 3 units			
Reflection across the x-axis			
Reflection across the y-axis			
Vertical stretch by a factor of 4			
Vertical shrink by a factor of $\frac{1}{4}$			

Given the following equations, graph the parent function and the new graph on desmos or a graphing calculator and write how the graphs have been translated.

1. $f(x) = x^2 + 2$

2. $f(x) = |x - 2|$

3. $f(x) = |x + 1|$

4. $f(x) = (x + 3)^2$

For #5 & 6 use the same instructions as above but first predict what the translations will be. Were you correct?

5. $f(x) = (x + 2)^2 - 3$

6. $f(x) = |x - 5| + 4$

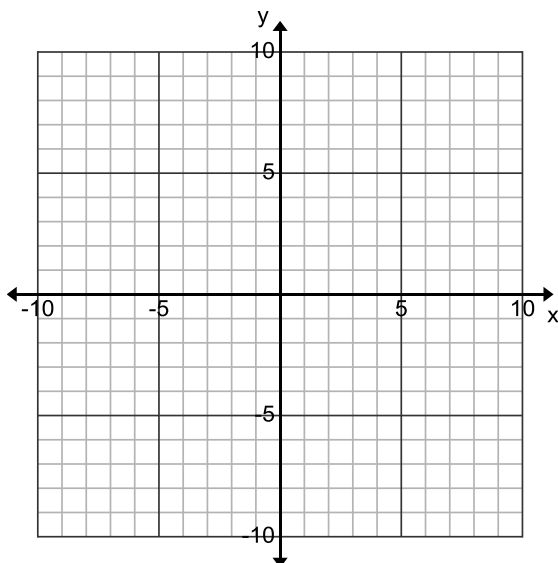
Prediction:

Prediction:

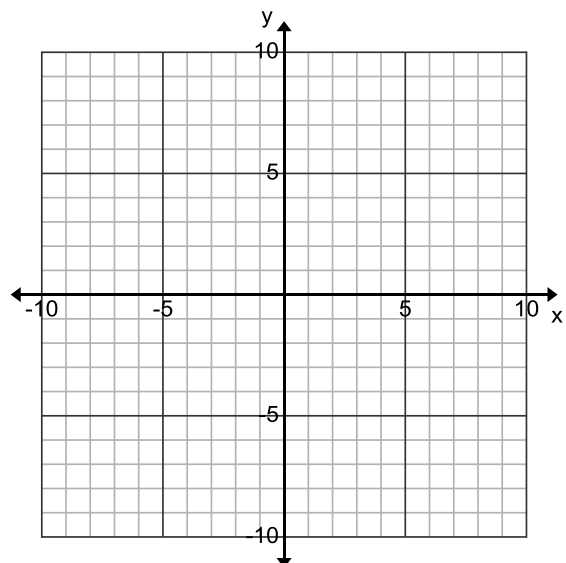
7. Can you come up with some general rules?

Now for #7-8 look at the function given, graph the parent function and graph the transformed graph without a calculator. You need to include the 5 points of the PF and at least 3 points for the new function.

7. $f(x) = (x - 4)^2 + 1$



8. $f(x) = |x + 3| + 2$

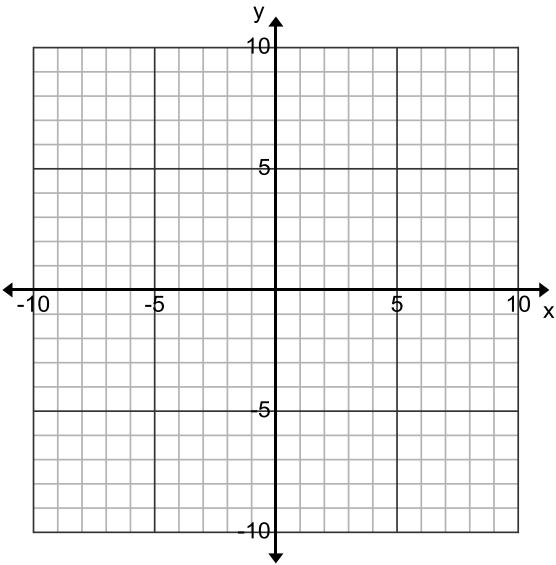


Translations of Graphs

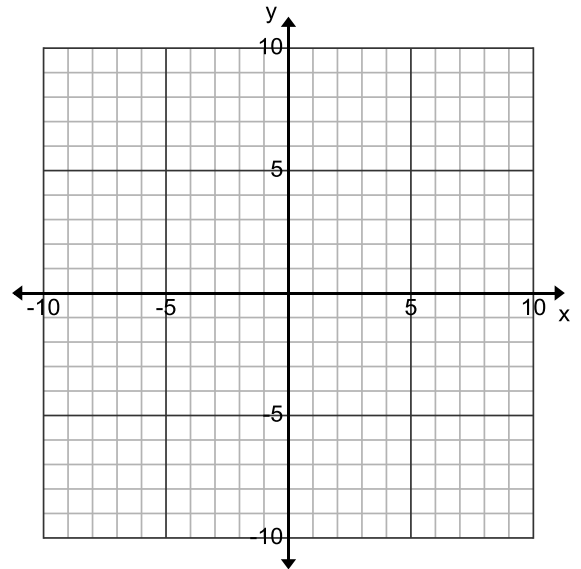
Overall Notes:

Examples:

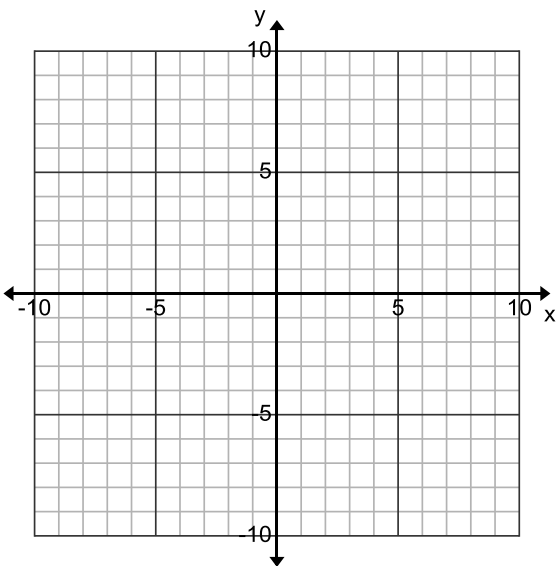
1. $f(x) = x^2 + 1$



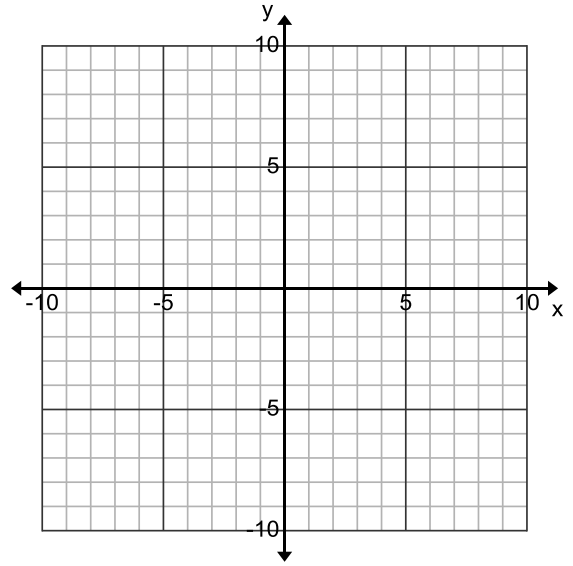
2. $f(x) = |x - 5|$



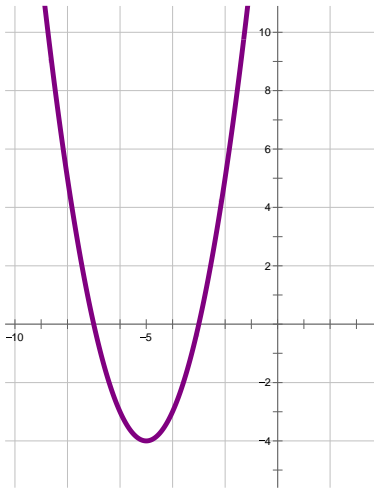
3. $f(x) = |x - 6| - 2$



4. $f(x) = (x + 1)^2 - 4$



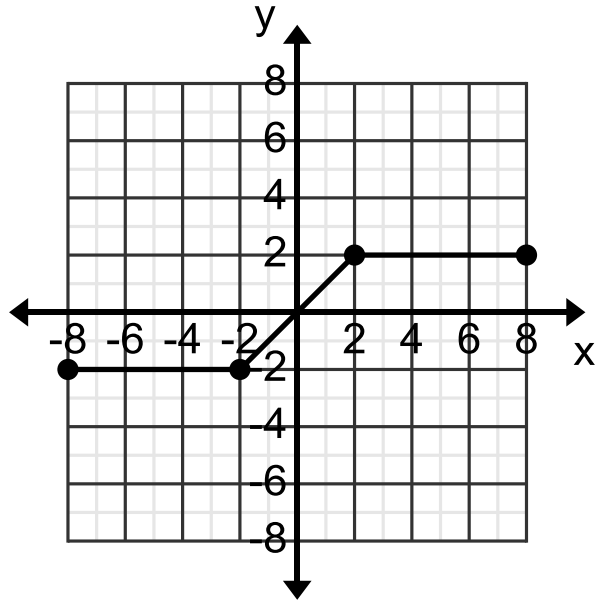
5. Write the equation of the graph



6. Given the graph, do the following transformations in different colors

a. $f(x+2)$

b. $f(x)+3$



7. Write the equation for each transformation.

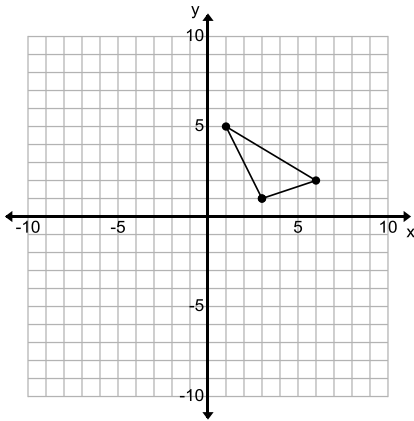
a. Translate the graph of $f(x) = x^2$ up 10 units and right 3 units

b. Translate the graph of $f(x) = |x|$ down 4 units and left 2 units

Reflections of Graphs Investigation

You will need 3 different colored writing utensils.

Step 1: Put the coordinates of the vertices of the triangle in the table.



Original:

x	y

Step 2: Using a second color, reflect the original figure across the x -axis on the graph above. Fill out the table with the new coordinates.

Reflected across the x -axis:

Color: _____

Compare with the original table, what has changed?

x	y

Step 3: Using a third color, reflect the original figure across the y -axis on the graph above. Fill out the table with the new coordinates.

Reflected across the y -axis:

Color: _____

Compare with the original table, what has changed?

x	y

Step 4: Given the table below, complete the table for each type of reflection. Graph your tables to check your answers.

x	y
-2	2
-4	0
-5	4

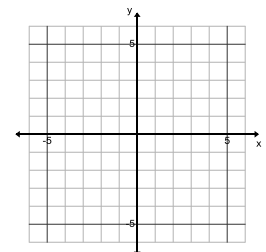
Reflect across the y -axis

x	y

Reflect across the x -axis

x	y

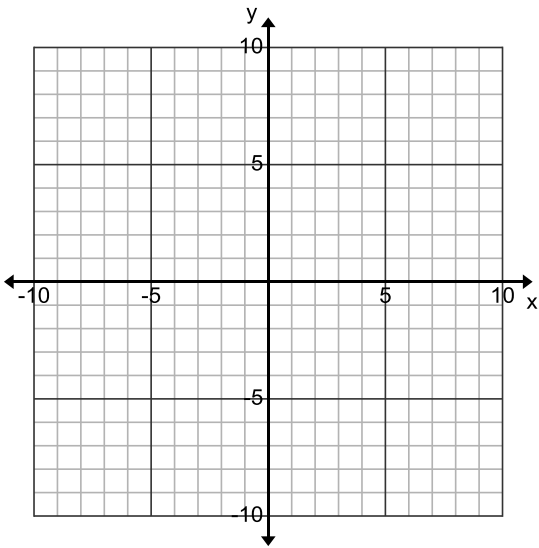
Check your answers:



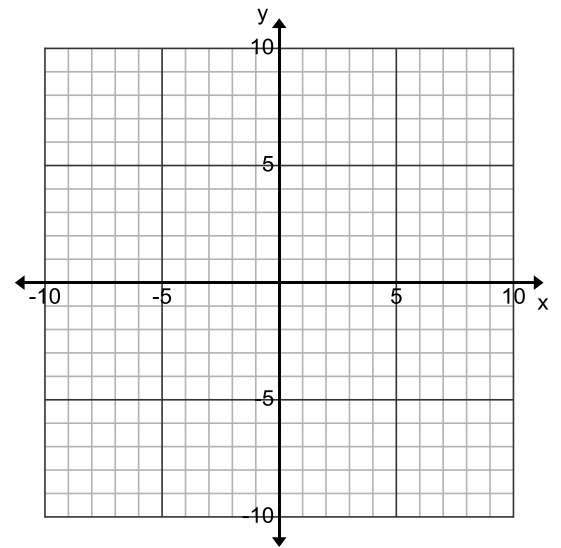
Overall Notes on Reflections:

Examples:

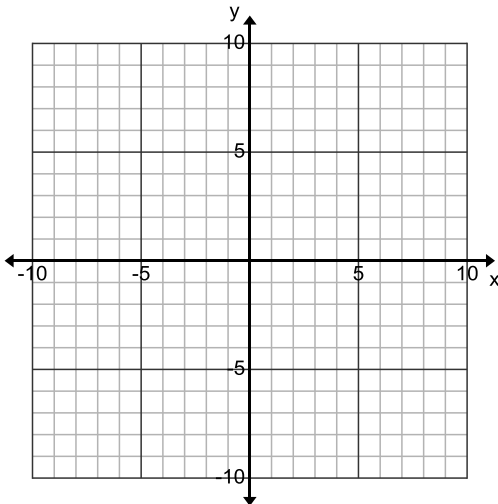
1. $y = -(x)^2$



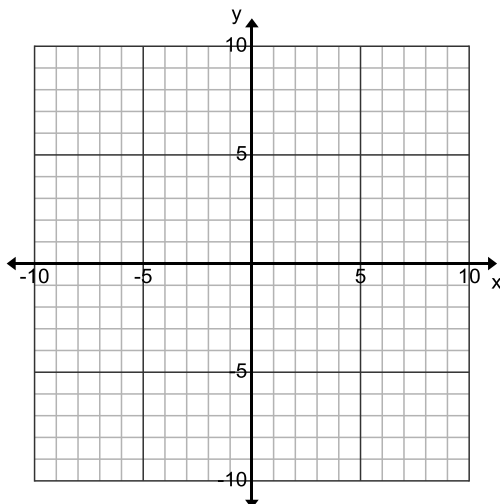
2. $y = -|x|$



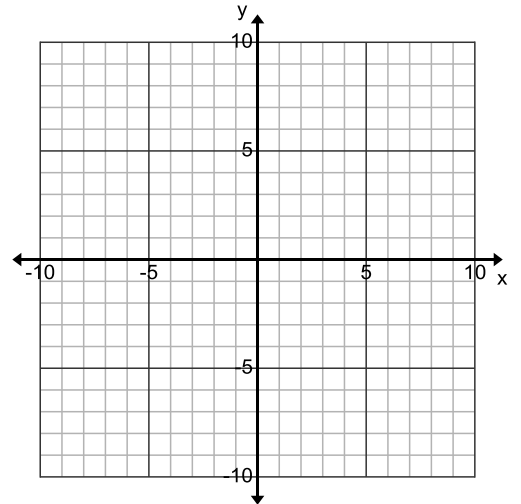
3. $y = -x^2 + 5$



4. $y = -|x+2|$

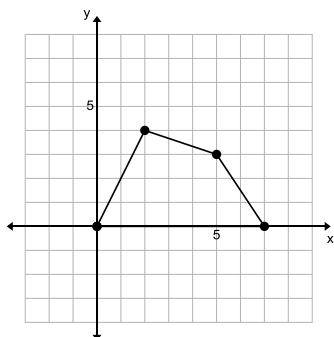


5. $y = -(x-3)^2 - 2$



Vertical Dilations for Graphs Investigation

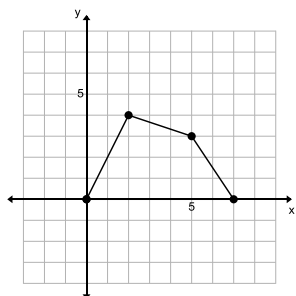
Step 1: Put the coordinates of the vertices of the quadrilateral in the table.



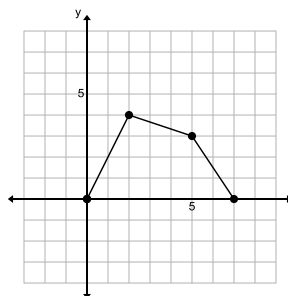
Original:

x	y

Step 2: Using the original table above, complete the table according to the rule and graph. Describe how the graph changed.



x	2 · y

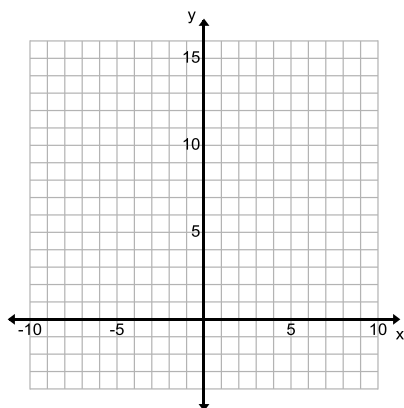


x	1/2 · y

Transformation: _____

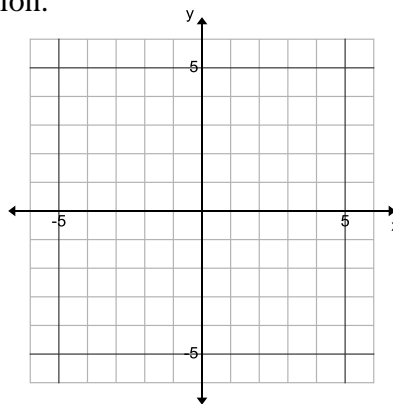
Transformation: _____

Step 3: Graph the appropriate parent function on both graphs below in one color. Then using a second color and complete the table, graph, and describe the transformation.



$$y = 3x^2$$

x	x ²	3x ²
-2		
-1		
0		
1		
2		



$$y = \frac{1}{4}x^2$$

x	x ²	1/4 x ²

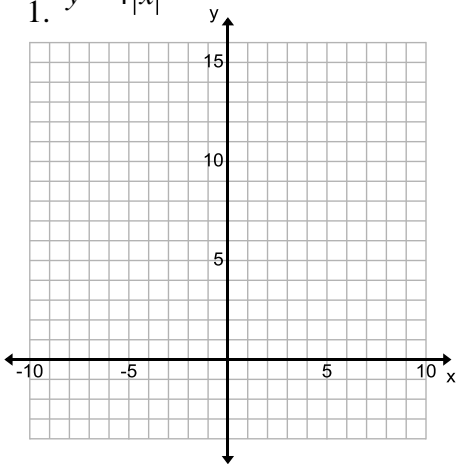
Transformation: _____

Transformation: _____

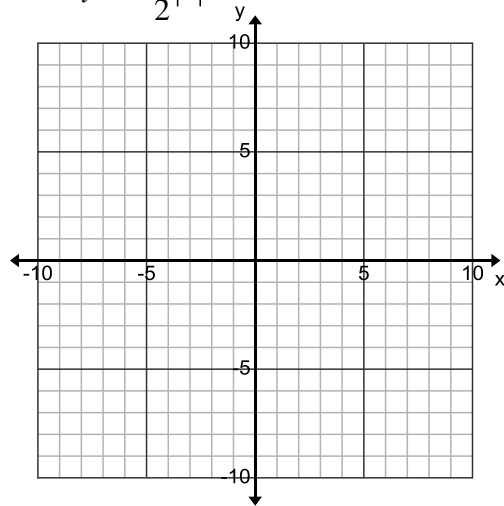
Overall Notes:

Examples:

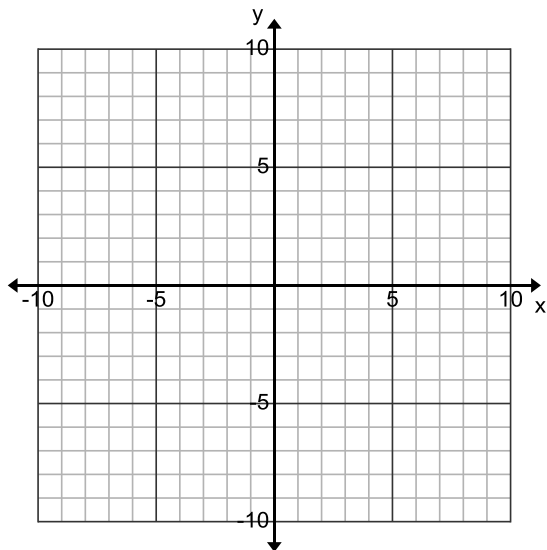
1. $y = 4|x|$



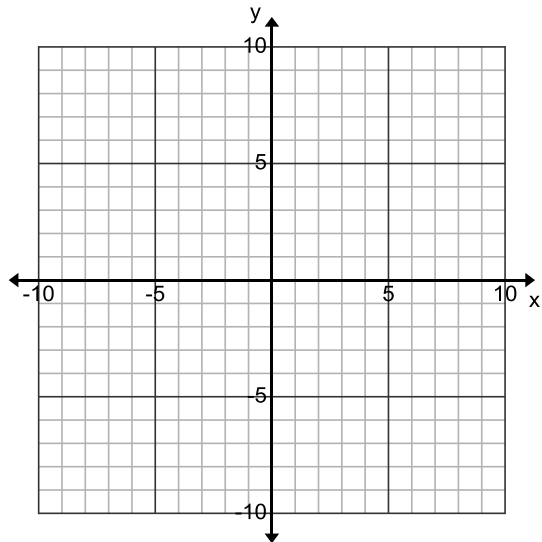
2. $y = -\frac{1}{2}|x|$



3. $f(x) = -2|x-1|$



4. $f(x) = \frac{1}{4}(x+1)^2 - 2$



5. Write the equation of the graph given the transformations.

a. the graph $f(x) = x^2$ moved up 2 and vertically dilated by 5

b. the graph $f(x)$ moved left 4, vertically dilated by 3 and reflected over the x-axis

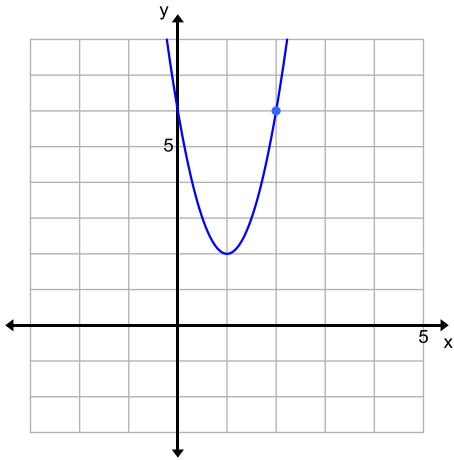
c. the graph of $f(x) = |x|$ reflected over the y-axis, moved down 4 and vertically dilated by $\frac{1}{2}$

Solving for the Vertical Dilation (a)

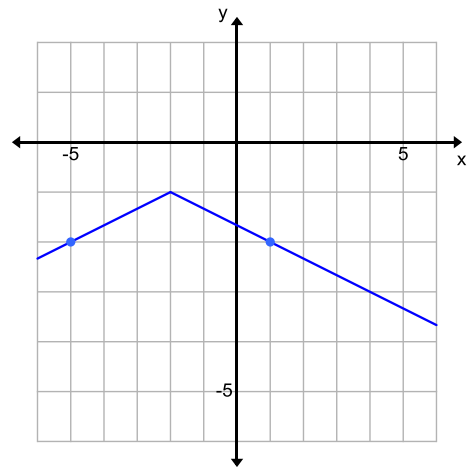
Overall Notes:

Examples:

1.



2.



3.

