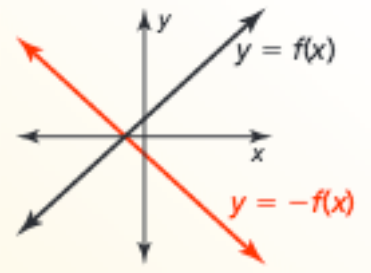
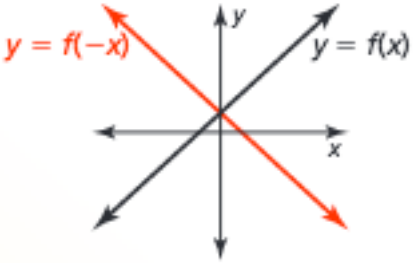
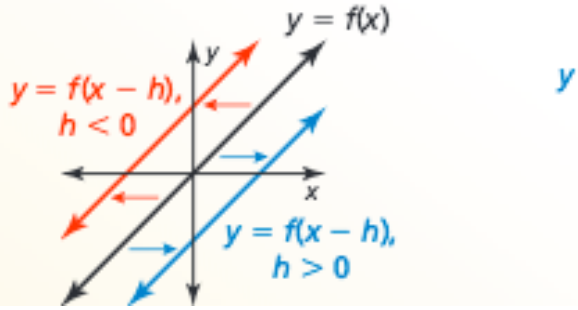
A103

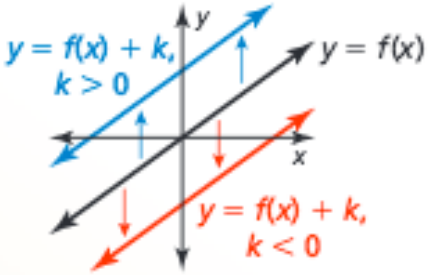
The graph of y = -f(x) is a reflection of y = f(x) on the x-axis.
The graph of y = f(-x) is a reflection of y = f(x) on the y-axis.





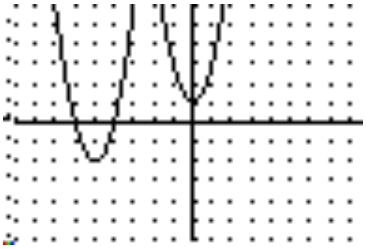
The graph of y = f(x – h) is a horizontal translation of the graph of y = f(x).
The graph of y = f(x) + k is a vertical translation of the graph of y = f(x).





Let $f(x) = 2x^2 + 1$. Write a function that is a translation of 3 units down and 5 units left.

$$f(x) + 3 = 2(x+5)^2 + 1 \rightarrow f(x) = 2(x^2 + 10x + 25) + 1 - 3 \rightarrow f(x) = 2x^2 + 20x + 48$$

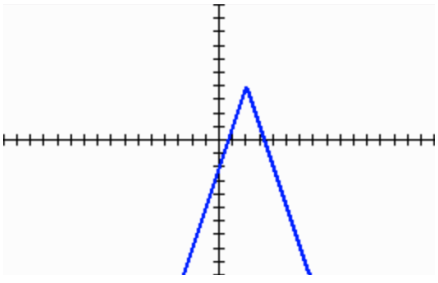


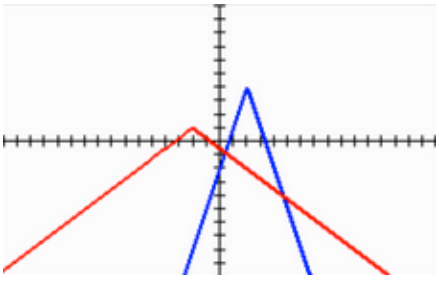
$f(x) = -3|x-2| + 4$. Write the equation for g(x), a Reflection across the y-axis and Vertically Shrank by ¼ and Show each step.

Reflection across the y-axis: $h(x) = -3|-x-2| + 4$

Vertical Shrink by ¼ : $g(x) = \frac{1}{4}\left(-3|-x-2| + 4\right)$

Simplify: $g(x) = -\frac{3}{4}|-x-2| + 1$





Assignment 103
01.02 – Transformations of Linear and Absolute Value Functions
Page 16, #'s 1, 2, 5, 7, 9, 10, 12, 14, 18, 20, 23-26, 29, 32, 33, 34, 36, 37, 39, 42, 46, 51

Algebra 2A Assignment 103 Friday, September 11, 2015 Hour: Name:

01.02 – Transformations of Linear and Absolute Value Functions

Page 16, #'s 1, 2, 5, 7, 9, 10, 12, 14, 18, 20, 23-26, 29, 32, 33, 34, 36, 37, 39, 42, 46, 51

1. **COMPLETE THE SENTENCE** The function $g(x) = |5x| - 4$ is a horizontal _____ of the function $f(x) = |x| - 4$.

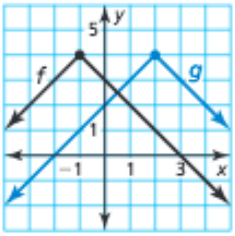
2. **WHICH ONE DOESN'T BELONG?** Which transformation does *not* belong with the other three? Explain your reasoning.

Translate the graph of $f(x) = 2x + 3$ up 2 units.	Shrink the graph of $f(x) = x + 5$ horizontally by a factor of $\frac{1}{2}$.
Stretch the graph of $f(x) = x + 3$ vertically by a factor of 2.	Translate the graph of $f(x) = 2x + 3$ left 1 unit.

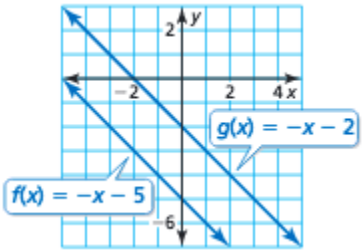
Write a function g, whose graph represents the indicated transformation of f.

5. $f(x) = |4x + 3| + 2$; translation 2 units down

7. $f(x) = 4 - |x + 1|$;



9. Describe two different translations of the graph of f that result in the graph of g.



10. You open a café. The function f(x) = 4000x represents your expected net income (in dollars) after being open x weeks. Before you open, you incur an extra expense of $12,000. (a) What transformation of f is necessary to model this situation? (b) How many weeks will it take to pay off the extra expense?

Write a function g whose graph represents the indicated transformation of the graph of f. Use a graphing calculator to check your answer.

12. $f(x) = \frac{1}{2}x - 3$; reflection in the x-axis.

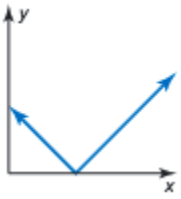
14. $f(x) = |2x - 1| + 3$; reflection in the y-axis.

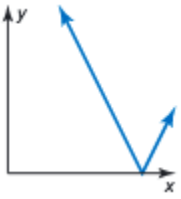
Write a function g whose graph represents the indicated transformation of the graph of f. Use a graphing calculator to check your answer.

18. $f(x) = 2x + 6$; vertical shrink by a factor of ½.

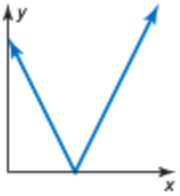
20. $f(x) = |x + 3|$; horizontal stretch by a factor or 4.

Match the graph of the transformation of f with the correct equation shown. Explain your reasoning.
Given the graph of f(x) below: Pick a) $y = 2f(x)$; b) $y = f(2x)$; c) $y = f(x + 2)$; d) $y = f(x) + 2$

23.


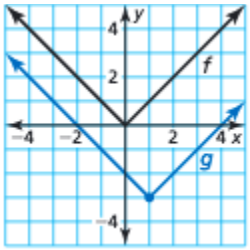
24.


25.


26.


Write a function g whose graph represents the indicated transformation of the graph of f.
29. $f(x) = |x|$; translation 2 units to the right followed by a horizontal stretch by a factor of 2.

32. $f(x) = |x|$



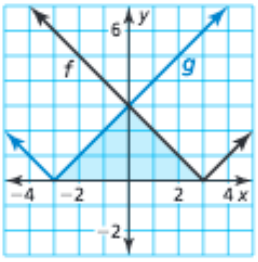
Identify and correct the **error** in writing the function g whose graph represents the indicated transformations of graph f.
33. $f(x) = |x|$; translation 3 units to the right followed by a translation 2 units up gives $g(x) = |x + 3| + 2$

34. $f(x) = x$; translation 6 units down followed by a vertical stretch by a factor of 5 gives $g(x) = 5x - 6$

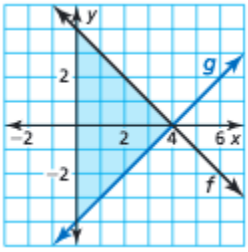
36. During a recent period of time, bookstore sales have been declining. The sales (in billions of dollars) can be modeled by the function $f(t) = -\frac{7}{5}t + 17.2$, where t is the number of years since 2006. Suppose sales decreased at twice the rate. (a) How can you transform the graph of f to model the sales? (b) Explain how the sales in 2010 are affected by this change.

Describe the transformation of the graph of f to the graph of g.
Then find the area of the shaded triangle.

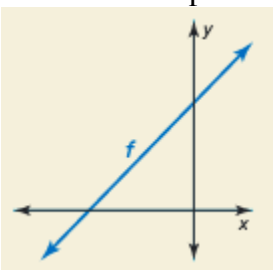
37. $f(x) = |x - 3|$



39. $f(x) = -x + 4$



42. Consider the graph of $f(x) = mx + b$. Describe the effect each transformation has on the slope of the line and the intercepts of the graph.



a. Reflect the graph of f in the y-axis.

b. Shrink the graph of f vertically by a factor of 1/3.

c. Stretch the graph of f horizontally by a factor of 2.

46. Evaluate the function $f(x) = x + 4$ at $x = 3$.

51. Create a scatter plot of the data.

x	2	5	6	10	13
$f(x)$	22	13	15	12	6