Pre-Calculus 30
Unit 3 – Transforming Graphs of Functions

1. What do you think you will learn this unit?

2. What seems familiar about this unit?

3. What is your goal for this unit?

4. What steps will you take to meet this goal?

5. What is your comfort level, at this point, for this unit?

0 1 2 3 4 5

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Unit 3 – Transforming Graphs of Functions

1. What have you learned this unit?

2. Did you meet your goal?

3. If you met your goal, how did you meet it? If you did not meet your goal, what do you need to work on?

4. What did you enjoy about this unit?

5. What did you dislike about this unit?

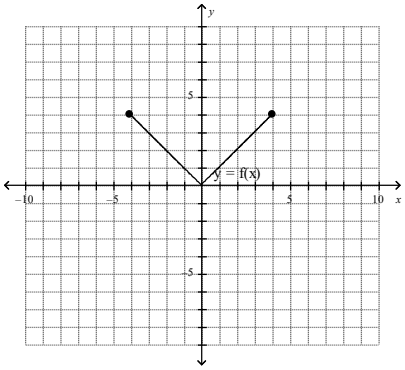
6. What is your comfort level, at this point, for this unit?

0 1 2 3 4 5

Unit Summary

Unit 3 – Portfolio Questions

3.1 – Transforming Graphs of Functions - Translations



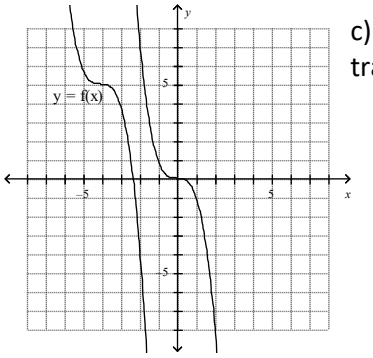
a) Here is the graph of $y = f(x)$. On the same grid, sketch the graph of $y - 3 = f(x - 2)$. Describe how the graph of $y = f(x)$ was translated. State the domain and range of each function.

b) Write an equation for the following situations:

i) Translated 2 units down

ii) Translated 3 units left

iii) Translated 1 unit up and 4 units right

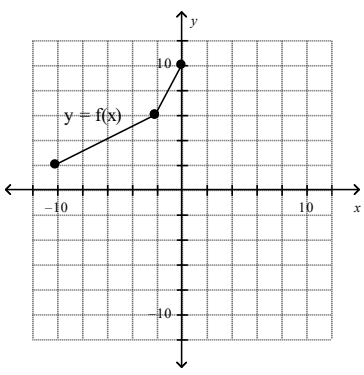


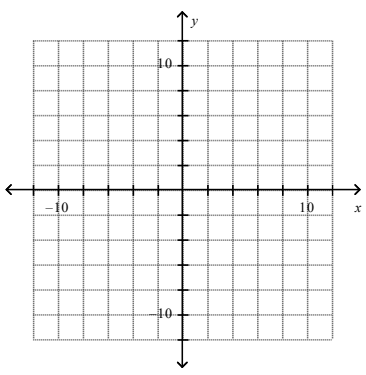
c) The graph of $y = f(x)$ is the image of the graph of $y = x^3$ after a horizontal and vertical translation. What is an equation of the image graph?

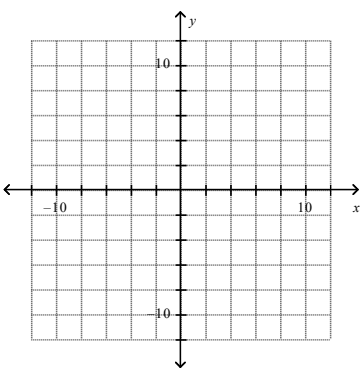
3.2 – Reflecting Graphs of Functions

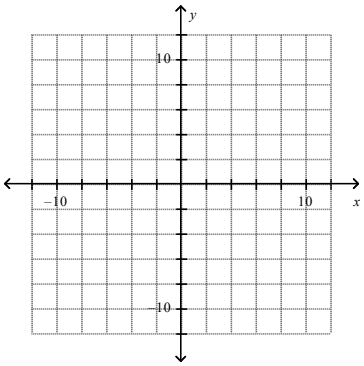
The following is a graph of y = f(x). Sketch the following and state the domain and range:

b) $y = -f(x)$ c) $y = f(-x)$ d) $y = -f(-x)$



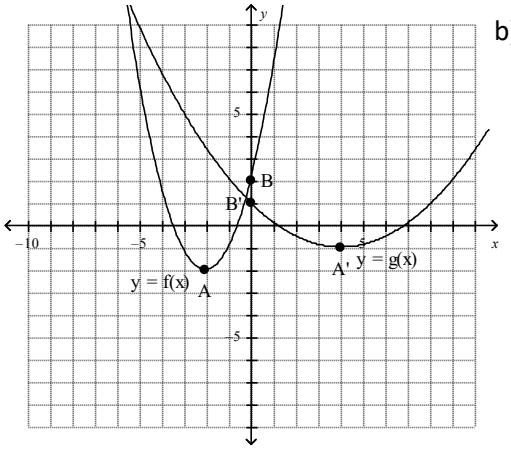






3.3 – Stretching and Compressing Graphs of Functions

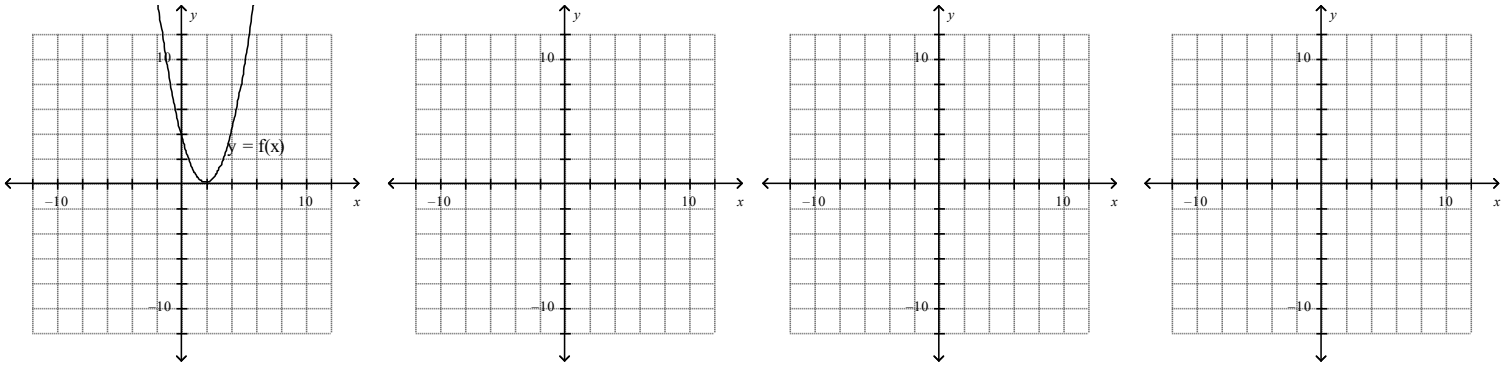
a) The graph of $y = 4x + 3$ is stretched horizontally by a factor of $\frac{7}{6}$, stretched vertically by a factor of $\frac{3}{2}$, and reflected in the x-axis. What is an equation of the image graph in terms of x?



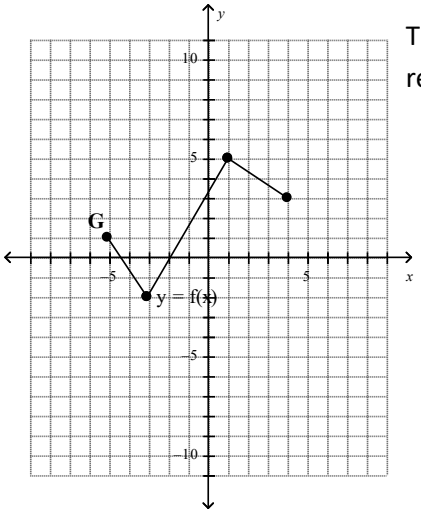
b) The graph of $y = g(x)$ is a transformation image of the graph of $y = f(x)$. Corresponding points are labelled. Write the equation of the image graph in terms of the function *f*.

c) For the graph of $y = f(x)$ shown below, sketch the following graphs:

a) $y = 3f(x)$ b) $y = f(-2x)$ c) $y = 4f(0.5x)$

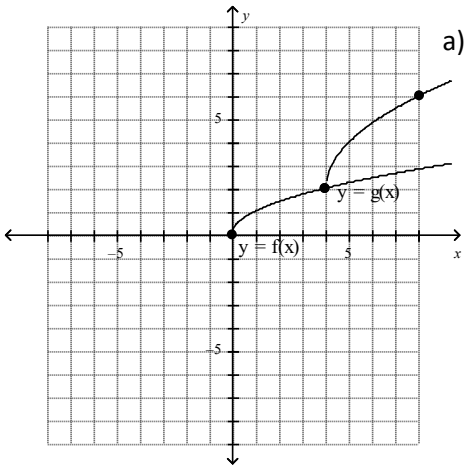


3.4 – Combining Transformations of Functions - Part 1

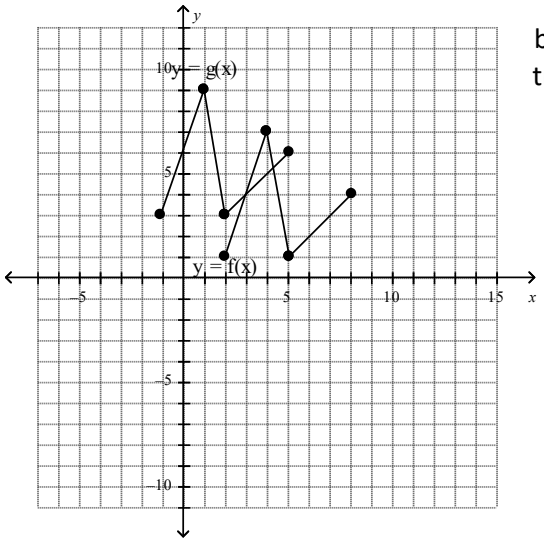


The following is the graph y = f(x). Graph the transformation image of the graph that is represented by the equation $y + 2 = -2f(2(x + 3))$. State the domain and range.

3.4 – Combining Transformations of Functions – Part 2

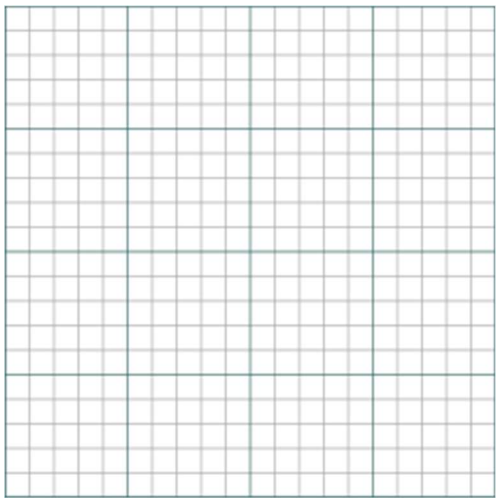


a) The graph of $y = g(x)$ is the image of the graph of $y = f(x)$ after a stretch or compression, and a pair of translations. Corresponding points are indicated. Describe the transformations.

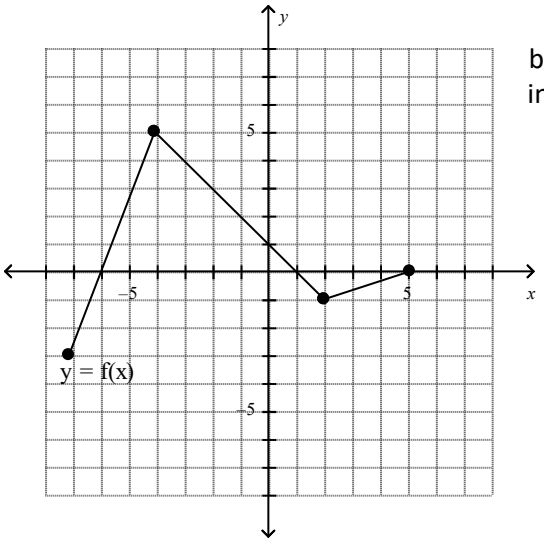


b) The graph of $y = g(x)$ is the image of the graph of $y = f(x)$ after a pair of translations. What is an equation of the image graph in terms of the function *f*?

3.5 – Inverse Relations – Part 1

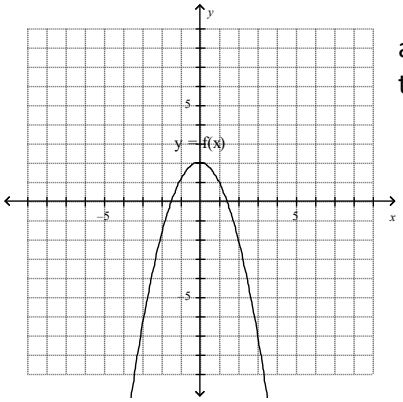


a) Determine an equation of the inverse of the function $y = 2x^2 + 5$. Sketch the function and it's inverse, state the domain and range and if it is a function.

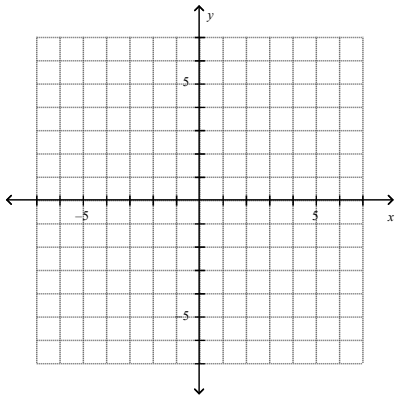


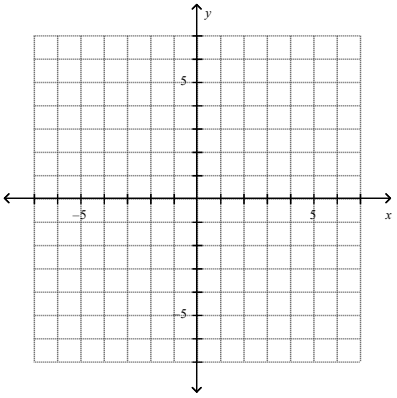
b) Here is the graph of $= f(x)$. On the same grid, sketch the graph of its inverse.

3.5 – Inverse Relations – Part 2



a) Here is the graph of $y = -x^2 + 2$. On the same grid, sketch the graph of its inverse. State the domain and range, and if this is a function. Show two ways to restrict the domain of $y = f(x)$, graph each option, label all equations, and state the domain of the image graph.





b) Determine whether these functions are inverses of each other. Justify your answer.

$$y = \frac{5}{7}x + 4 \qquad\qquad y = \frac{7}{5}(x - 4)$$