Homework 7: Due Friday March 31st in recitation.

Late homework will not be accepted. **Write on only one side of each page. Staple all work.**

1. Graph the following functions

   (a) $f(x) = 5|x+3| - 11$.

   (b) $f(x) = 2\sqrt{-x} + 3$

   (c) $f(x) = 2[-x]$. Note that $[x]$ is the greatest integer function.

2. Is $f(x) = x + \frac{1}{x}$ even, odd, or neither. If it is even or odd, use symmetry to graph it.

3. Suppose that f and g linear functions. Let's assume that $f(x) = m_1x + b$ and $g(x) = m_2x + b$. Show that $f \circ g$ is a linear function. Find it's slope and y-intercept.

4. Let $f(x) = 1 - \sqrt{x-2}$.

   (a) Draw the graph of $f(x)$ and state why f is 1-1.

   (b) Find the inverse of f.

   (c) Find the domain and the range of the inverse.

   (d) Graph $f(x)$ and the inverse $f^{-1}(x)$ on the same graph.

5. Do the same as problem 4. for the function $f(x) = 4 + \sqrt[7]{(x+5)}$.

6. The amount of a commodity that is sold is called demand. Suppose that you are told that the demand is 147 units when the price is 1. Moreover, you observe that there is no demand when the price is 50. Assuming that the demand D is a linear function of p

   (a) find the equation of the demand function D.

   (b) Find D^{-1}. What does D^{-1} represent.

   (c) Find $D^{-1}(25)$. What does your answer represent.

7. Suppose that $f(x) = 2x^2 + 12x + 10$.

   (a) Write $f(x)$ in standard form by completing the square.

   (b) Find the vertex of f.

   (c) Find the x and y-intercepts of f.

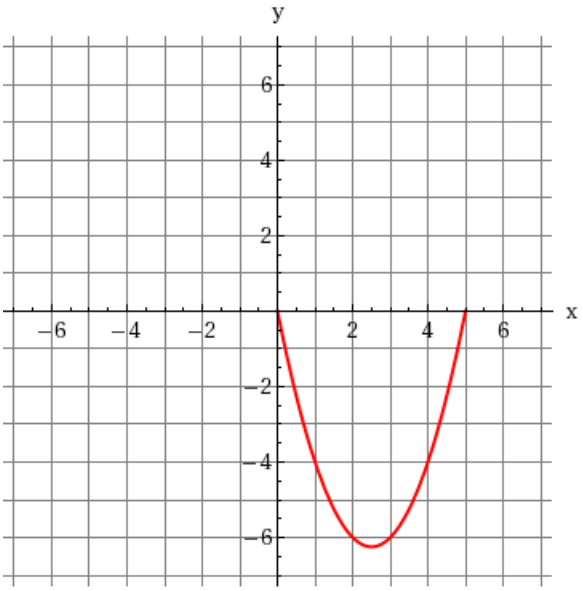
   (d) Find the domain and the range of f.

   (e) Sketch the graph of f. Make sure to label the vertex and x, y intercept(s).

   (f) How would you restrict the domain of f so that the resulting function is 1-1. Note there are two answers.

   (g) Find the inverse of f assuming the restrictions found in part (f).

Bonus. Let $f(x)$ be have the following graph



(a) Complete $f(x)$ for $x < 0$ to make an even function.

(b) Complete $f(x)$ for $x < 0$ to make an odd function.