MAT 136: Calculus I - Fall 2013
Weekly Homework 1

NAME:

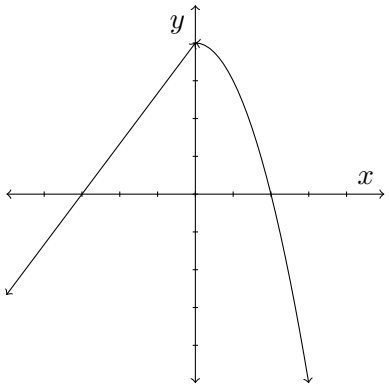
Instructions

Complete each of the following exercises. Your solutions should be complete and neatly written. In particular, you should show all of your work. You may write your solutions on these pages or on your own paper. This assignment is due on **Thursday, September 12**. During class on Thursday, September 12, we will spend the majority of the class time having students present their proposed solutions to the problems below.

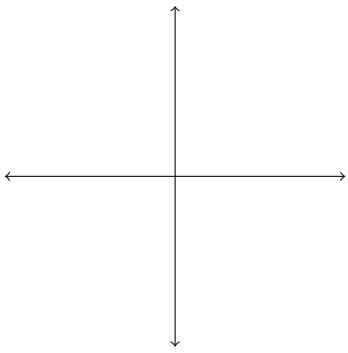
Exercises

1. Determine an equation of the line that passes through $(1, -1)$ and is parallel to the line $x - 5y - 3 = 0$. It does not matter what form your answer takes.

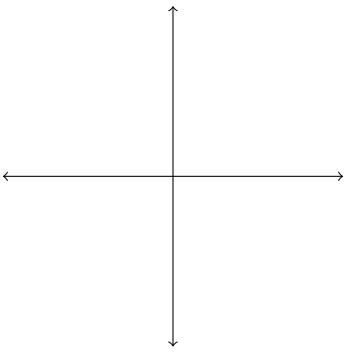
2. Suppose the graph of the function f is given below.



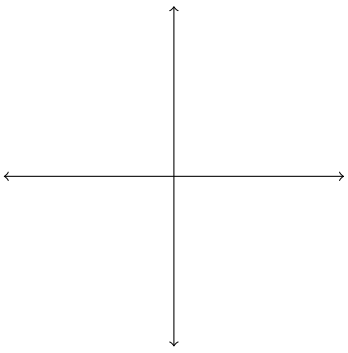
Carefully sketch a graph of each of the following.



(a) $y = f(-x)$

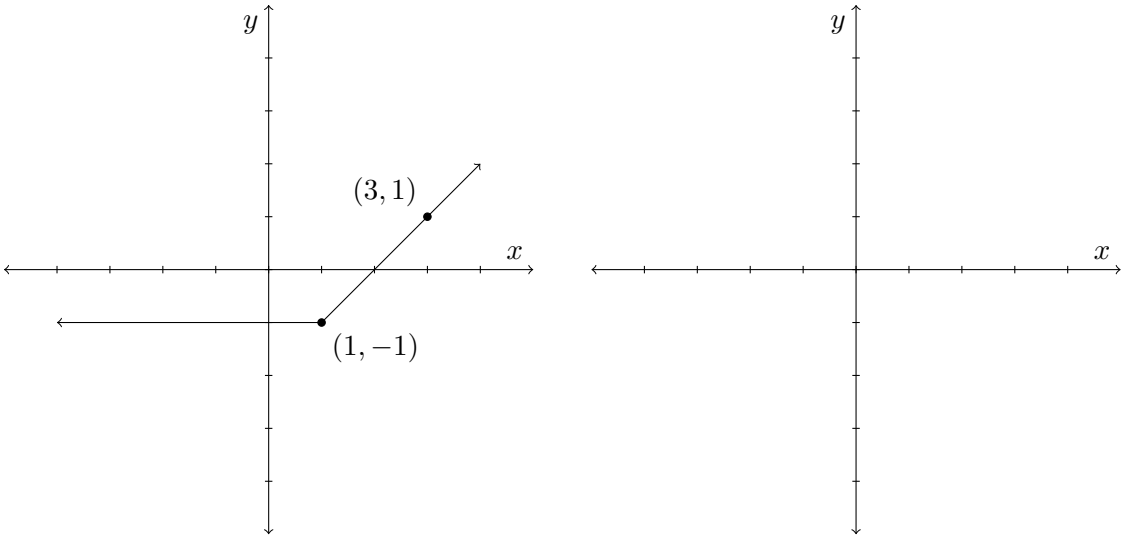


(b) $y = |f(x)|$



(c) $y = f(|x|)$

3. Consider the graph of the function $y = f(x)$ given in the left figure below. Using the axes provided on the right, sketch the graph of the function $y = 2f(-1 - x) + 2$.



4. Consider the function $f(x) = -\sqrt{2(x+1)} - 3$. How would you obtain the graph of f from the function $g(x) = \sqrt{x}$? That is, describe in words the sequence (order matters) of transformations for obtaining the graph of f from the graph of g. You do *not* need to sketch the graph of either function.

5. The position in meters of a particle moving in a straight line (but not necessarily always moving in the same direction) is given for some values of time t in seconds in the following table.

t	0	.1	.2	.3	.4
$p(t)$	0	.2	.1	.7	1.3

Using the technique that we discussed in class, estimate the instantaneous velocity at $t = .2$ seconds. Be sure to label your answer with correct units.

 Written by D.C. Ernst

6. Suppose a nugget is thrown in the air from a height of 100 meters on planet Nuggeton and assume that the height of the nugget after t seconds is given by $p(t) = -10t^2 + 35t + 100$, where $p(t)$ is measured in meters. Find the most simplified expression you can for the average velocity of the ball on the interval $[2, 2 + h]$, where h is a small positive number.

7. In an emergency, Batman rushes to destroy a doomsday device 30 miles away turning on the rockets mounted on his Batmobile. His average speed is 200 mph. After saving the world, he leisurely cruises back to the Batcave with an average speed of 100 mph. What is his average speed during the whole excursion?*

*This is Exercise 2.1.4 from *NAU Calculus I Lecture Notes* by Neuberger, Sieben, and Swift.

