Math 110
Exam 1
Fall 2007

Name: _____

1. Your exam contains 6 questions and 5 pages; Please make sure you have a complete exam.
2. The entire exam is worth 50 points. Point values for problems vary and these are clearly indicated. You have 50 minutes for this exam.
3. Make sure to ALWAYS SHOW YOUR WORK; you will not receive any partial credit unless all work is clearly shown. If in doubt, ask for clarification.
4. If you need extra space, use the back of the page and clearly indicate this.
5. You are allowed one 8.5×11 sheet of handwritten notes (both sides). Graphing and scientific calculators are allowed.

Problem	Total Points	Score
1	5	
2	6	
3	15	
4	9	
5	6	
6	9	
Total	50	

1. (5 points) Where does the circle of radius 10 centered at (-3, 2) intersect the vertical line $x = 5$?

2. Let $f(x) = \sqrt{-3x - 12}$.

(a) (4 points) What is the domain of $f(x)$?

(b) (2 points) What is the range of $f(x)$?

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

(a) (2 points) What is $f(5)$?

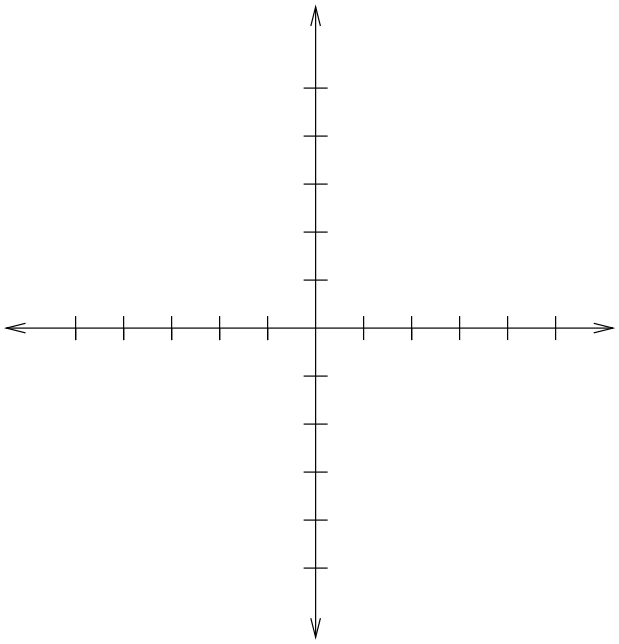
(b) (4 points) What is $f(2x)$? (Don't forget to simplify!)

(c) (6 points) Find $\frac{f(a+h)-f(a)}{h}$.

(d) (3 points) If $f(x) = 7$, find x.

4. Let $f(x) = \begin{cases} x+5 & \text{if } x < -2 \\ x^2 - 1 & \text{if } -2 \leq x \leq 2 \\ 3 & \text{if } x > 2 \end{cases}$.

(a) (5 points) Sketch the graph of $f(x)$.



(b) (4 points) State any interval(s) on which the graph of $f(x)$ is decreasing.

5. (6 points) State, in order, the steps you would follow to obtain the graph of $g(x) = \frac{1}{4}(x-5)^3 - 2$ from the graph of $f(x) = x^3$. (You do *not* need to sketch the graph.)

6. A ball is thrown in the air. It's height after t seconds can be modeled by the formula $h(t) = -16t^2 + 80t + 5$.

(a) (5 points) What is the average speed of the ball (the average rate of change of the ball's height) from $t = 0$ to $t = 2$?

(b) (4 points) What is the maximum height the ball reaches?