

Math 110
Exam 1
January 23, 2007

Name: _____

1. Your exam contains 8 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	11	
2	5	
3	6	
4	4	
5	6	
6	4	
7	8	
8	6	
Total	50	

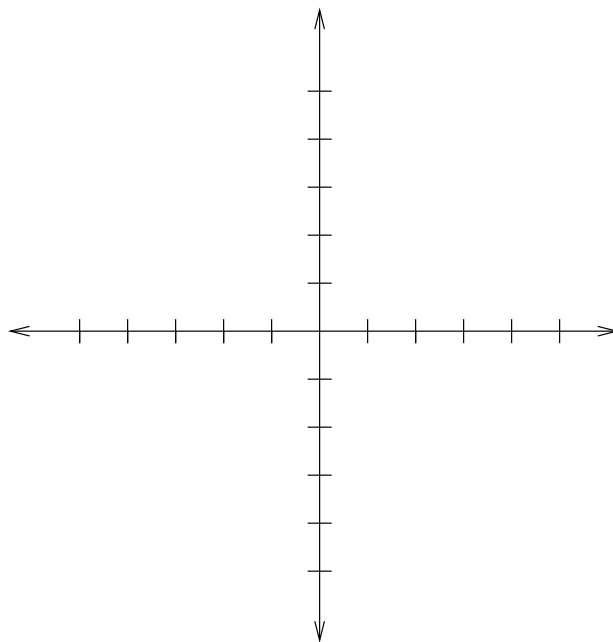
1. (11 points) Let $f(x)$ be the piecewise defined function given by

$$f(x) = \begin{cases} -1 & \text{if } x < -2 \\ x & \text{if } -2 \leq x < 2 \\ 1 & \text{if } x \geq 2 \end{cases}$$

(a) (2 points) Find $f(1)$.

(b) (2 points) Find $f(-2)$.

(c) (5 points) Sketch a graph of $f(x)$ on the axes below.



(d) (2 points) Using your graph in part (c), determine any intervals on which $f(x)$ is increasing or decreasing.

2. (5 points) Does the following equation define y as a function of x ? Why or why not?

$$2x^2 + 3y = 6$$

3. (6 points) Let $f(x) = x^2 + 6x + 5$.

(a) (4 points) Express $f(x)$ in standard form.

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

4. (4 points) What is the domain of $g(x) = \frac{1}{\sqrt{x+3}}$?

5. (6 points) Suppose the graph of a function $f(x)$ is given. Describe how the graph of $y = -2f(x + 3) + 4$ is obtained from the graph of $f(x)$.

6. (4 points) Is the function $h(x) = 2x^3 - \frac{2}{x}$ even, odd, or neither? (Be sure to show work to support your answer).

7. (8 points) Let $f(x) = x^2 - 3x$.

(a) (4 points) Find the rate of change from $(0, f(0))$ to $(2, f(2))$.

(b) (4 points) Find the rate of change from $(a, f(a))$ to $(a + h, f(a + h))$.

8. (6 point) A ball is thrown in the air. It's height after t seconds is given by the function $h(t) = -16t^2 + 40t + 6$. What is the maximum height the ball reaches?