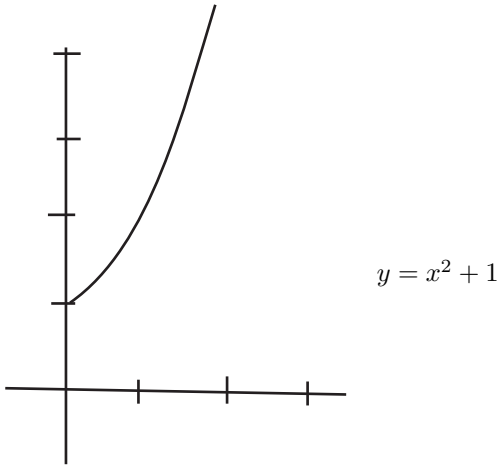
Name:_____

**Test 1**
Spring 2008
MATH 121 Section 02
February 13, 2008

**Directions :** You have 50 minutes to complete all 5 problems on this exam. There are a possible 100 points to be earned. You may not use your book, notes, or any graphing/programmable calculator. Please be sure to show all pertinent work. *An incorrect answer with no work will receive no credit!* If any portion of the exam is unclear please come to me and I will elaborate provided I can do so without giving away the problem.

1. (20 points)
   Find a $\delta > 0$ so that $x^2 + 1$ is within 0.1 of 2 whenever $x$ is within $\delta$ of 1.



2. (20 points)
Find a value of $c$ so that the function

$$f(x) = \begin{cases} cx^2 - 2cx + 1 & x \geq 1 \\ -cx - 4 & x < 1 \end{cases}$$

is continuous everywhere.

3. (20 points)
Let

$$f(x) = \frac{5}{x+3}.$$

Find the equation of the line that is tangent to the graph $y = f(x)$ at the point $(0, 1)$.

4. (20 points)
   Show that there exists a solution to the equation

$$x^5 + -2x^4 + x^3 + x^2 - 2x = 5.$$

5. (20 points)
Using the graph of the function $y = f(x)$ below, order the values

$$f'(1) \qquad f'(2) \qquad f'(4) \qquad f(6) \qquad f'(8) \qquad f(9)$$

from least to greatest. [Notice that not all of these expressions have a '.]