Math 163A **Fall 2003** **Guide for Test 1**

The first test is in class on Friday 26 September.

Here are some sample questions, so that you have an idea of what to expect. '*' means a number or function that would be filled in.

1. (a) Find the equation for the line that passes through the point $(*, *)$ and the point $(*, *)$.
   (b) Find the equation for the line that passes through the point $(*, *)$ and has slope $*$.
   (c) Find the point where these two lines intersect.
   (d) Graph both lines.

2. Consider the parabolic function $f(x) = *x^2 + *x + *$.
   (a) Find its x-intercepts (if it has any).
   (b) Find its axis and vertex.
   (c) Graph it.

3. Given the graph of $f(x)$ below [*pretend*], graph
   (a) $-3f(x)$
   (b) $f(x) - 3$
   (c) $f(x - 3)$
   (d) $f(-3x)$

4. Compute the following limits:
   (a) $\lim_{x \to 2} \dfrac{x^2 - 4}{x - 2}$
   (b) $\lim_{h \to 0} \dfrac{x^2 - (x - h)^2}{h}$
   (c) $\lim_{x \to 4} \dfrac{x - 4}{\sqrt{x} - 2}$
   (d) $\lim_{x \to -\infty} \dfrac{x^2 - 4}{x - 2}$

5. It costs you \$** to buy a gizmo that makes widgets, and then \$** to make each widget. Widgets sell for \$**. How many do you need to sell to break even?

6. You are in a club that is raising money by each selling advertizing on your t-shirts, and then wearing them around campus. The other people find that if they charge \$$p$ per ad, then they sell $N(p) = -*p+*$ ads. How much should you charge per ad in order to bring in the maximum amount of money? What is the maximum amount?

7. Consider the function $f(x) = * * *$.
   (a) Find its domain and range.
   (b) Find its asymptotes (if it has any).
   (c) Find all the points where it is not continous.
   (d) Find its instantaneous rate of change at the point $x = *$.