Math 266A   **Winter 2005**   **Guide for Test 1**

The first test is in class on Friday 21 January.

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 $(1, 4)$ and has slope -1.

   (b) Find the two points where this line intersects the parabola $y = *x^2 + *$. (Solve for them; no credit for guessing.)

   (c) Graph the line and the parabola.

2. Consider the relationship $s = **$.

   (a) Use a logarithmic transformation to uncover a linear relationship.

   (b) Plot the (linear) relationship between the transformed quantities, labeling the axes and two points on the function.

3. A population of 15,000 small deer in a certain region has grown exponentially to 17,000 in four years. At this rate, how long will it take the population to reach 45,000?

4. Let $a_n = **$

   (a) Find a so that $\lim_{n \to \infty} a_n = a$.

   (b) Find N so that $|a_n - a| < **$ whenever $n > N$.

   (c) Compute $\lim_{n \to \infty} \frac{a_n + *}{*}$

5. The [Beverton-Holt/Logistic/Ricker] model for restricted population growth of rabbits is

$$N_{t+1} = ***$$

   (a) Explain what the parameter $*$ represents. What sort of environmental change would cause $*$ to increase? If it does increase, how would a plot of the sequence N_t change?

   (b) If the parameters stay fixed at $* = *$ and $* = *$ for 100 years, how many rabbits would there be?