MATH 113 – FALL 2002 **Name:**

Practice for Exam I (September 28,2002)

Part A In Class

1. a) Write the number 3.26×10^{10} without using scientific notation.

b) Solve for x: $2x + 3 = \pi x - 5$.

c) Sketch a graph which is increasing and concave up between $x = 0$ and $x = 3$ and is increasing and concave down between $x = 3$ and $x = 6$.

2. A cooked chicken is taken out of the oven and left to cool in the kitchen. The following table gives the temperature, T, of the chicken (in ^{o}F), t minutes after it is removed from the oven.

t	T
0	400
20	171.1
40	100.0
60	77.9
80	71.1
100	68.9
120	68.3

a) What is the temperature of the chicken the instant it is removed from the oven?

b) Over which 20 minute period does the chicken cool most rapidly?

c) Find the average rate of change of temperature of the chicken over the first 20 minutes after it is removed from the oven.

d) Explain in practical terms what $T(15)$ means and estimate its value.

e) What is the limiting value for T.

f) Explain how your answer for e) might shed some light on the temperature of the room.

3. The attached graph represents the number of baby girls in the United States named Hope (measured in 1000s) as a function of time in years since 1950.

a) In what year does the number of baby girls in the United States named Hope reach its maximum?

b) How many baby girls are named Hope by their parents that year?

c) Express in function notation the number of girls named Hope in the year 1970 and find that value.

d) During what years is the graph of the function both increasing and concave up? How would you interpret this?

e) Where does the graph have point(s) of inflection? How would you interpret this?

4. A company charges 20 dollars plus 2 dollars per pound to ship a package to Paris overnight. A second company charges 10 dollars plus 3 dollars per pound to ship a package to the same destination.

a) For each company write a formula expressing cost of shipping, C, in terms of the weight, w, of the package.

b) How heavy would a package have to be to cost the same to ship with either company?

c) For the weight you determined in b), find the cost of shipping.