MATH 1310 Programming Project #3

You have the whole class period to work on the project with your group. Write your answers on a separate paper. You are required to use your own calculator and turn in your own paper. Be sure to answer all of the questions asked.

1. Write a program called FEVAL ("function evaluation") to do the following:
   i) Prompt the user to enter a value for x.
   ii) Display the phrase "f(x) = "
   iii) Display the value of f(x) for the function which you have previously entered as y1 in the graphing menu.

2. For $f(x) = x^x$ evaluate f(.1), f(.01), f(.001), and f(.0001). What value do you think f(x) approaches as x gets closer and closer to zero?

3. Write a program called MSEC ("slope of the secant line") to do the following:
   i) Prompt the user to enter a value for A.
   ii) Prompt the user to enter a value for H
   iii) Calculate and display the quantity $\frac{f(A+H)-f(A)}{H}$, where f(x) has been previously entered as y1 in the graphing menu. Tomorrow in class, we will discuss why this quantity is called the slope of the secant line for the function f(x).

4. Modify MSEC so that, instead of prompting for H, it calculates and displays slopes of the secant lines for H = .1, .01, .001, .0001, and .00001. (Hint: $.1 = 10^{-1}, .01 = 10^{-2}...$).

5. Use MSEC to estimate the slope of the curve $y = x^x$ at the point x=1. What do you think the actual slope is?