MATH 1351 TI-85 EXERCISE IV
Graphical investigations of limiting behavior

Name: _____ SID: _____

1. Graph each of the following in the **ZDECM** viewing window. Explain the presence of the discontinuity at x = 1 and discuss the limiting behavior as x approaches 1.

a. y = (x^2 - 1) / (x - 1)

b. y = | x^2 - 1 | / (x - 1)

c. y = (x^2 - 1) / |x - 1|

2. In problem #1 write each function in terms of equations of lines on various intervals.
(Problems 41 - 43 on page 20 are examples of such.)

a   b..   c.

    y =   y =   y =

3. a. Estimate the limit to 5 decimal places as x goes to 0 of the expression   (1 + x)^(1/x) .

_____

   b. Compute e^1.   _____

4. Graph the function   y = (sin x) / x   in **RADIAN MODE** . Using **TRACE** and **ZOOM** estimate the limit as x approaches 0. _____

5. a. Repeat exercise #4 in **DEGREE MODE.** The limit to 5 decimal places is approximately

    _____

   b. Recall that 1 degree equals Pi/180 radian .   Compute Pi/180 .   _____

6. Return to **RADIAN MODE**, sketch the graph and "evaluate" the limiting behavior as x approaches 0 for each of the following functions.

     a. $y = \sin(1/x)$

     b. $y = x \sin(1/x)$

     c. $y = x^2 \sin(1/x)$

In your own words describe the difference you observe between the graphs of   a, b and c. (It might help to "overlay" the graphs of $y = 1$ & $y = -1$ on the graph of a, the graphs of $y = x$ & $y = -x$ on the graph of b, and the graphs of $y = x^2$ and $y = -x^2$ on the graph of c.)