Fall 2012 MATLAB Assignment 2

Work the following problems (NOTE: these are RELATED TO the corresponding page and problem number from Gilat. Do NOT work the actual problems from the Lab Manual, or you will receive NO CREDIT!)

1. **g091x22**: Show that $\lim\limits_{x \to 0} \dfrac{e^x - 1}{x} = 1$. Do this by creating a vector x that has elements: 1, 0.5, 0.1, 0.01, 0.001, 0.00001, and 0.0000001. Then, create a new vector $y = \dfrac{e^x - 1}{x}$ (remember to use element-by-element operations). Use format long to display the elements of y.

2. **g092x28**: Let $A = \begin{bmatrix} 5 & 2 & 4 \\ 1 & 7 & -3 \\ 6 & -10 & 0 \end{bmatrix}$, $B = \begin{bmatrix} 11 & 5 & -3 \\ 0 & -12 & 4 \\ 2 & 6 & 1 \end{bmatrix}$, $C = \begin{bmatrix} 7 & 14 & 1 \\ 10 & 3 & -2 \\ 8 & -5 & 9 \end{bmatrix}$.

   (a) Calculate AB and BA. Are they equal?

   (b) Calculate $(AB)C$ and $A(BC)$. Are they equal?

   (c) Calculate $(AB)^t$ and $B^t A^t$ (^{t} means transpose). Are they equal?

   (d) Calculate $(A + B)^t$ and $A^t + B^t$. Are they equal?

3. **g163x02**: Plot the function $f(x) = \dfrac{40}{1 + (x - 4)^2} + 5\sin\left(\dfrac{20x}{\pi}\right)$ in the domain $0 \le x \le 10$.

4. **g164x09**: Plot the function $f(x) = \dfrac{x^2 - 4x - 5}{x - 2}$ for $-4 \le x \le 8$. Notice that, like the problem in Gilat, this function has a vertical asymptote at $x = 2$.

5. Also work **s485x56** from the Stewart text.