Dr. Wolfe MATH 240 MATLAB PROJECT #0 Due October 2, 2008

This project is to be done with MATLAB, and you should hand in your printed output. Use the **diary** command to save your work. Edit the saved file to include your name, the problem numbers, and the answers to any questions asked in the problems. Then print your file. For further information on MATLAB, consult the introduction posted on the class website. Whenever you use a new MATLAB command learn about it by using the **help** command; *e.g.*, type **help ezplot** to learn about the **ezplot** command.

1. Enter the Matrices and column vectors

$$A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}, \quad B = \begin{pmatrix} 1 & -1 \\ -2 & 4 \end{pmatrix}, \quad C = \begin{pmatrix} 2 & -1 & 0 \\ 1 & 4 & 7 \end{pmatrix}, \quad D = \begin{pmatrix} 3 & -5 & -1 \\ 7 & 6 & 3 \end{pmatrix}$$

$$\mathbf{x} = \begin{bmatrix} 3 \\ 5 \end{bmatrix}, \qquad \mathbf{y} = \begin{bmatrix} -1 \\ 1 \end{bmatrix}$$

   Note: To enter A type [1 2;3 4]
   (a) Compute (if possible) $A + B$, AC, CA, $A\mathbf{x}, B\mathbf{y}, 4A - 3B$. Note: To multiply matrices A and B type $A * B$.
   (b) Check that $(A + B)C = AC + BC$, $A(C + D) = AC + AD$, $B(3\mathbf{x} - 2\mathbf{y}) = 3B\mathbf{x} - 2B\mathbf{y}$.
   (c) Compute A^{-1}, A^3, $A^2 - 5A - 2I$, A^T. Note: The command for A^{-1} is **inv**(A), the command for A^3 is A^3 and the command for A^T is A'.
   (d) Solve $B\mathbf{z} = \mathbf{y}$ with the command $B\backslash y$.

2. Ex.37, p.49, *Lay* Use the command **rref**.

3. Ex.12, p.101 *Lay*.

4. Ex.35, p.117 *Lay*.

5. Ex.9, p.132 *Lay*.

6. Use the **ezplot** command to graph the following functions
   (a) $y = \sin x$ over $[-2\pi, 2\pi]$.
   (b) $y = x^2$ over $[-1, 3]$.
   (c) $y = \sin^2 x$ over $[0, \pi]$.

   Note: Your graphs will not be saved by the use of the **diary** command. The command **print** will cause the current graphics window to be printed at your default printer.

7. Type the following commands and observe the result:

$$x = 0 : .01 : 2 * \text{pi}; \; y = \sin(x); \; \mathbf{plot}(x, y)$$