MATH 111 – MATLAB ASSIGNMENT 1 – DUE 5 JUNE 2013

Answer all of the following questions. You may work in groups of no more than **three persons** to complete this assignment. One copy of the completed assignment is to be turned in for each group.

You are expected to turn in the following items:

1. A printout of a MATLAB diary file containing the MATLAB commands and output that you used to complete the assignment. You must also include text explaining what you are doing. This can be done in two ways, (a) by typing comments directly on the MATLAB command line (MATLAB ignores everything typed after a `%` sign, or (b) by editing your diary file afterward in a text editor.

2. Any hand calculations that you are asked to do as part of the assignment. These should be put on a separate sheet of paper.

3. Turn in your assignment as either a `.txt` file or as a `.pdf` file through Blackboard.

This assignment is due before 9:30 am on Wednesday 5 June 2013. No late assignments will be accepted. You may turn in the assignment early if you wish.

1. (6 pts. each) Consider the linear system
$$\begin{array}{rcrcrcr} x & + & 3y & + & z & = & 10 \\ -x & & & + & z & = & 5 \\ 3x & + & y & & & = & 0 \end{array}$$

   (a) In MATLAB, define `A` to be the 3×4 augmented matrix equivalent to the above system of equations.

   (b) Use MATLAB commands to do the row operations on the matrix `A` used by the Gauss-Jordan method in order to solve the system of equations. Use a separate MATLAB command for each row operation. For example, the first command will be to add the first row to the second and replace the second row by this sum. This command would be: `A = [A(1,:); A(1,:)+A(2,:); A(3,:)]`.

   (c) Solve the system by using MATLAB's `rref` command.

2. (6 pts. each) Find all solutions (if any) to each of the following linear systems using MATLAB's `rref` command as demonstrated in class.

   (a)
$$\begin{array}{rcrcrcrcr} x & - & y & + & 2z & + & w & = & 9 \\ .3x & & & + & .52z & + & w & = & 1.62 \\ .6x & + & 2y & - & z & & & = & 3 \\ .2x & + & .43y & + & .6z & + & w & = & 2.15 \end{array}$$

   (b)
$$\begin{array}{rcrcrcr} x & + & y & - & 3z & = & 2 \\ 2x & & & - & z & = & 1 \\ 3x & - & 2y & & & = & 0 \\ 6x & - & y & - & 3z & = & 5 \end{array}$$

   (c)
$$\begin{array}{rcrcrcr} .3x & + & .5y & + & z & = & 4 \\ 5x & - & 2y & + & .8z & = & 7 \\ 5.6x & - & y & + & 2.8z & = & 15 \end{array}$$