Problems due:
Due Date: Friday August 22nd, 2014.

1. Using Linear Algebra solve the system of equations to find the interpolating polynomial $y = p(\cdot)$ from the data:

t	0	1	2
y	-1	3	6

2. (BR Ex 5 Page 190) Obtain a system $Ax = b$ for which :

$$\{x : Ax = b\} = \{x : x = \begin{bmatrix} 1 + 4\alpha + 3\beta \\ 2 + 3\alpha \\ 1 + 8\beta \\ \alpha + 5\beta \end{bmatrix}, \alpha, \beta \in \mathbb{R}\}$$

3. Consider the system given by $Ax = b$ where

$$A = \begin{bmatrix} 2 & 1 & 1 \\ 4 & -6 & 0 \\ -2 & 7 & 2 \end{bmatrix} \text{ and } b = \begin{bmatrix} 5 \\ -2 \\ 9 \end{bmatrix}$$

   (a) Perform the following elementary row operations in the following sequence: $R_{21}(-2), R_{31}(1), R_{32}(1)$ on the matrix A and b separately. The system will reduce to $Ux = c$, find U and c.

   (b) Let P be the corresponding transforming matrix from the above operations that ensures $PA = U$.

   (c) Find $L = P^{-1}$ and notice that $L = PU$.

4. (GS Ex 9 page 40)Using elementary row operations find the factors Q, L and U for the matrices A below

$$\begin{bmatrix} 2 & 1 \\ 8 & 7 \end{bmatrix}, \begin{bmatrix} 3 & 1 & 1 \\ 1 & 3 & 1 \\ 1 & 1 & 3 \end{bmatrix}, \begin{bmatrix} 1 & 1 & 1 \\ 1 & 4 & 4 \\ 1 & 4 & 8 \end{bmatrix},$$

such that $QA = LU$ with Q, L, U as discussed in class.