Math 202-171 Quiz 5.

Name_____ Section___ Serial #___Id_____

Q1: The eigenvalues of $A = \begin{pmatrix} 2 & 1 \\ -4 & 2 \end{pmatrix}$ are $2 + (\sqrt{-1}\,)2$, $2 - (\sqrt{-1}\,)2$.

Find a fundamental real set of solutions of the system $X' = AX$

Q2: $A = \begin{pmatrix} 1 & 1 & 1 \\ 0 & 1 & 1 \\ 0 & 0 & 2 \end{pmatrix}$

a) Find all eigen vectors for the eigen value 2 and give a basis of these eigenvalues.

b) Find all column vectors $\vec{v} = \begin{pmatrix} x \\ y \\ z \end{pmatrix}$ such that $(A - 1I)^2\, \vec{v} = \vec{0}$ and give a basis of such generalized eigenvectors.

c) Give a fundamental set of solutions of the system $X' = AX$ from the bases you found in parts (a) and (b)