HOMEWORK 9-PART C

1. Find a fundamental set of real solutions of the system $x' = Ax$, where $A = \begin{pmatrix} -1 & -2 \\ 4 & 3 \end{pmatrix}$.

2.(a) Determine the following vectors of functions are linearly independent or not? $\begin{pmatrix} -e^{-t} \\ -e^{-t} \\ e^{-t} \end{pmatrix}, \begin{pmatrix} 0 \\ -e^{t} \\ 2e^{t} \end{pmatrix}, \begin{pmatrix} e^{2t} \\ 0 \\ 2e^{2t} \end{pmatrix}$.

(b)Determine the following vectors of functions are linearly independent or not? $\begin{pmatrix} e^{-t} \\ e^{-t} \\ 2e^{-t} \end{pmatrix}, \begin{pmatrix} -e^{t} \\ 3e^{t} \\ 0 \end{pmatrix}, \begin{pmatrix} 2e^{-t} - 3e^{t} \\ 2e^{-t} + 9e^{t} \\ 4e^{-t} \end{pmatrix}$.

3. Determine the following vectors of functions are linearly independent or not? $\begin{pmatrix} 2cost - sint \\ cost \end{pmatrix}, \begin{pmatrix} 2sint + cost \\ sint \end{pmatrix}$