# Algebra_Assignment 02

## Q5:

Use the elementary operations, find the row- echelon matrix

a/ $A = \begin{pmatrix} 1 & 2 \\ -1 & 1 \\ 2 & 3 \end{pmatrix}$ ; b/ $B = \begin{pmatrix} 1 & 2 & 1 \\ -1 & 1 & 3 \\ 2 & 7 & 6 \end{pmatrix}$ c/ $C = \begin{pmatrix} 3 & -5 & 4 \\ 2 & -1 & 3 \\ 1 & 2 & 5 \end{pmatrix}$

d/ $D = \begin{pmatrix} 1 & 2 & -1 & 0 \\ -1 & 2 & 4 & 2 \\ 3 & 6 & -3 & 0 \end{pmatrix}$ e/ $E = \begin{pmatrix} 1 & 1 & -1 & 0 \\ 3 & 4 & 2 & 1 \\ -2 & 0 & -1 & -3 \end{pmatrix}$

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## Q6:

Use the elementary operations, find the row- echelon matrix

a/ $A=\begin{pmatrix} 6 & 0 & 4 \\ 2 & 6 & 8 \\ -3 & 4 & 1 \end{pmatrix}$

b/ $B=\begin{pmatrix} 1 & 1 & 2 & 3 \\ 2 & 5 & 7 & 2 \\ 1 & 8 & 3 & 1 \end{pmatrix}$

c/ $C=\begin{pmatrix} 1 & 1 & 1 & 3 \\ 2 & 5 & 7 & 2 \\ 1 & 2 & 3 & 1 \end{pmatrix}$

d/ $D=\begin{pmatrix} 1 & 1 & 1 & 3 \\ 2 & 5 & 7 & 0 \\ 1 & 2 & 3 & 1 \end{pmatrix}$

e/ $E=\begin{pmatrix} -2 & 1 & 3 & 4 \\ 1 & -3 & 2 & -3 \\ -1 & -2 & 5 & 1 \end{pmatrix}$

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## Q7:

Given $A^{-1} = \begin{pmatrix} 1 & -1 & 3 \\ 2 & 0 & 5 \\ -1 & 1 & 0 \end{pmatrix}$. Find a maxtrix $X$ such that

a/ $AX = \begin{pmatrix} 1 \\ -1 \\ 3 \end{pmatrix}$ b/ $AX = \begin{pmatrix} 1 & -1 & 2 \\ 0 & 1 & 1 \\ 1 & 0 & 0 \end{pmatrix}$ c/ $XA = \begin{pmatrix} 1 & 2 & -1 \\ 3 & 1 & 1 \end{pmatrix}$

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## Q8:

Find $A$ when

a/ $(3A)^{-1} = \begin{pmatrix} 1 & 2 \\ 0 & -2 \end{pmatrix}$ b/ $(I + 2A)^{-1} = \begin{pmatrix} 2 & 1 \\ 3 & 2 \end{pmatrix}$

c/ $\left(A^{-1} - 2I\right)^T = -2\begin{pmatrix} 1 & 4 \\ 3 & 1 \end{pmatrix}$

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## Q9:

Solve for X

a/ $\begin{pmatrix} 1 & 2 \\ 2 & 3 \end{pmatrix} X = \begin{pmatrix} 1 & -1 \\ 3 & 3 \end{pmatrix}$

b/ $ABXC = B^T$

c/ $AX^TC = B$

(where $A, B$ and $C$ are nxn invertible matrices)

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## Q10:

Find $A^{-1}$ if

a/ $A^2 - 6A + 5I = 0$

b/ $A^2 + 3A - I = 0$

c/ $A^4 = I$