

Assignment 3 Ch 3

① Compute $A^{-5}I$, when $A = \begin{bmatrix} -9 & -1 & 3 \\ -8 & 7 & -6 \\ -4 & 1 & 8 \end{bmatrix}$

② Find the inverse of matrices by ERO, if exist.

(a) $\begin{bmatrix} 2 & 0 & -1 \\ 5 & 1 & 0 \\ 0 & 1 & 3 \end{bmatrix}$

(b) $\begin{bmatrix} 1 & 0 & -2 \\ -3 & 1 & 4 \\ 2 & -3 & 4 \end{bmatrix}$

③ Determine which of the matrices are invertible using Invertible matrix theorem.

(a) $\begin{bmatrix} 5 & 0 & 0 \\ -3 & -7 & 0 \\ 8 & 5 & -1 \end{bmatrix}$

(b) $\begin{bmatrix} 0 & 3 & -5 \\ 1 & 0 & 2 \\ -4 & -9 & 7 \end{bmatrix}$

④ Using invertible matrix theorem, show that A^T is invertible if $A = \begin{bmatrix} 1 & 0 & -2 \\ 3 & 1 & -2 \\ -5 & -1 & 9 \end{bmatrix}$.

⑤ Let $A = \left[\begin{array}{ccc|ccc} 3 & 0 & -1 & 5 & 9 & -2 \\ -5 & 2 & 4 & 0 & -3 & 1 \\ -8 & -6 & 3 & 1 & 7 & -4 \end{array} \right]$ and $B = \begin{bmatrix} 3 & 2 \\ 2 & 3 \\ 1 & 5 \\ 4 & 1 \\ -1 & 2 \\ 2 & 3 \end{bmatrix}$

The partitions of A & B are shown. Obtain AB , if possible

⑥ Let $A = \begin{bmatrix} 3 & 0 & -1 \\ -5 & 2 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} a & b \\ c & d \\ e & f \end{bmatrix}$. Find AB by applying column-row expansion.

⑦ Solve the Leontief production for economy with three sectors (manufacturing, Agriculture & service), given

$C = \begin{bmatrix} 0.2 & 0.2 & 0 \\ 0.3 & 0.1 & 0.3 \\ 0.1 & 0 & 0.2 \end{bmatrix}$ and $d = \begin{bmatrix} 40 \\ 60 \\ 80 \end{bmatrix}$.

⑧ Find LU factors:

(a) $\begin{bmatrix} 3 & -1 & 2 \\ -3 & -2 & 10 \\ 9 & -5 & 6 \end{bmatrix}$

(b) $\begin{bmatrix} 2 & -4 & -2 & 3 \\ 6 & -9 & -5 & 8 \\ 2 & -7 & -3 & 9 \\ 4 & -2 & -2 & -1 \\ -6 & 3 & 3 & 4 \end{bmatrix}$