

Practice Questions for Lecture # 4

Question # 1

Identify if the following matrices are in echelon form or reduced echelon form or not in both forms. Also give the reason to justify your answer.

a.
$$\begin{bmatrix} 1 & 2 & 3 & 4 \\ 0 & 0 & 1 & 4 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

b.
$$\begin{bmatrix} 6 & 2 & 1 & 4 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 4 & 0 \end{bmatrix}$$

c.
$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}$$

d.
$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}$$

e.
$$\begin{bmatrix} 1 & 1 & 2 \\ 0 & 1 & 1 \\ 0 & 0 & -2 \end{bmatrix}$$

f.
$$\begin{bmatrix} -1 & 0 & 2 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

g.
$$\begin{bmatrix} 1 & 2 & 3 \\ 0 & 1 & 2 \end{bmatrix}$$

Question # 2

For the given linear system $\begin{bmatrix} 2 & 3 & 5 & 7 \\ 0 & 2 & 3 & 9 \\ 0 & 0 & 0 & 0 \end{bmatrix}$, find the solution when free variable $z = 0$.

Question # 3

Apply elementary row operations to transform the following matrix into the reduced echelon form:

$$A = \begin{bmatrix} 3 & 6 & 9 \\ 1 & 3 & 3 \\ 4 & 8 & 5 \end{bmatrix}.$$

Question # 4

Apply elementary row operations to transform the following matrix into the echelon form:

$$A = \begin{bmatrix} 1 & 3 & 2 \\ 1 & 2 & 2 \\ 4 & -1 & -4 \end{bmatrix}$$

Question # 5

Apply elementary row operations to transform the following matrix into

- a. Echelon form:
- b. Reduced Echelon form

$$A = \begin{bmatrix} 1 & -3 & -2 & 1 \\ -6 & 2 & 5 & 3 \\ 2 & 1 & 1 & -3 \end{bmatrix}$$

Question # 6

Find the general solution of a linear system whose augmented matrix is $\begin{pmatrix} 1 & 1 & 3 \\ 3 & 2 & 1 \end{pmatrix}$

Question # 7

Find the general solution of a linear system whose augmented matrix is $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$