

Practice Questions Lecture # 3

Question # 1

Which of the following is a non-linear equation?

- a. $x_1 + x_2 + x_3 = 0$
- b. $x_1 + \sqrt{3}x_2 - x_3 = 1$
- c. $4x_1x_2 = 1$
- d. $x_1 = x_2$

Question # 2

Which of the following is the correct Coefficient matrix for the system
$$\begin{aligned} x_1 - x_2 - x_3 &= 6 \\ x_1 + 2x_2 &= 8 \\ 9x_3 &= 1 \end{aligned}$$
 ?

- a. $\begin{bmatrix} 1 & -1 & 6 \\ 1 & 2 & 8 \\ 0 & 0 & 1 \end{bmatrix}$
- b. $\begin{bmatrix} 1 & -1 & -1 \\ 1 & 2 & 0 \\ 0 & 0 & 9 \end{bmatrix}$
- c. $\begin{bmatrix} 1 & -1 & -1 \\ 1 & 2 & 8 \\ 9 & 0 & 1 \end{bmatrix}$
- d. $\begin{bmatrix} 1 & -1 & -1 & 6 \\ 1 & 2 & 0 & 8 \\ 0 & 0 & 9 & 1 \end{bmatrix}$

Question # 3. Write a system of linear equations corresponding to the following augmented matrices

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

b.
$$\begin{bmatrix} 1 & 2 & 3 & 0 \\ 4 & 9 & 2 & 6 \\ 6 & 0 & 5 & 3 \end{bmatrix}$$

Question # 4

Evaluate whether the following system is consistent or inconsistent.

a.
$$\begin{aligned} 2x + y &= 1 \\ -x - 7y &= 3 \end{aligned}$$

b.
$$\begin{aligned} 2x + 2y &= 5 \\ -2x - 2y &= 3 \end{aligned}$$

Question # 5

Is $x = 3$, $y = 1$ a solution of the following linear system? If not then give the reason.

$$\begin{aligned} x - 3y &= 1 \\ 5x - 2y &= 3 \end{aligned}$$

Question # 6

Determine whether the following system is consistent or inconsistent?

$$\begin{aligned} 2x + 3y + 4z &= 4 \\ 4x + 5y &= 6 \\ 2y + 7z &= 1 \end{aligned}$$

Question # 7

Determine whether the following system is consistent or inconsistent?

$$\begin{aligned} 3x - 2y + 3z &= 8 \\ x + 3y + 6z &= -3 \\ 2x + 6y + 12z &= -6 \end{aligned}$$