ICMA321 Linear Algebra

Online Quiz 1

1. How many solutions does the following system of linear equations (given by their augmented matrices) have?

$$\left[\begin{array}{ccc|c} 1 & -1 & 2 & 1 \\ 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & -2 \end{array}\right]$$

A. Zero

B. One

C. Infinite

2. How many solutions does the following system of linear equations (given by their augmented matrices) have?

$$\left[\begin{array}{ccc|c} 1 & 1 & 1 & 1 \\ 0 & 3 & 1 & 0 \\ 0 & 0 & 2 & 1 \end{array}\right]$$

A. Zero

B. One

C. Infinite

3. How many solutions does the following system of linear equations (given by their augmented matrices) have?

$$\left[\begin{array}{cccc|c} 1 & 1 & 1 & 1 & 1 \\ 0 & 2 & 1 & 0 & 3 \\ 0 & 2 & 1 & 0 & -3 \\ 0 & 0 & 1 & 0 & 1 \end{array}\right]$$

A. Zero

B. One

C. Infinite

4. How many solutions does the following system of linear equations (given by their augmented matrices) have?

$$\left[\begin{array}{cccc|c} 1 & 1 & 1 & 1 & 1 \\ 0 & 1 & 1 & 0 & 1 \\ 0 & 1 & 1 & 0 & 1 \\ 0 & 0 & 1 & 0 & 1 \end{array}\right]$$

A. Zero

B. One

C. Infinite

5. How many solutions does the following linear system have?

$$\begin{cases} x_1 + 2x_2 + x_3 &= 4 \\ x_2 - x_3 &= 1 \\ x_1 + 3x_2 &= 0 \end{cases}$$

A. Zero

B. One

C. Infinite

6. Which of the following systems has *no* solutions?

A. $\begin{cases} 2x_1 - x_2 &= 3 \\ x_1 + x_2 &= 1 \end{cases}$

B. $\begin{cases} 2x_1 - x_2 &= 3 \\ 4x_1 - 2x_2 &= 6 \end{cases}$

C. $\begin{cases} x_1 + x_2 &= 3 \\ 2x_1 - 2x_2 &= 6 \end{cases}$

D. $\begin{cases} 2x_1 - x_2 &= 3 \\ 4x_1 - 2x_2 &= 5 \end{cases}$

E. None of these.

7. Consider the following system

$$\begin{aligned} x_1 + x_3 &= 3 \\ x_1 - x_2 - x_3 &= 1 \\ x_2 - x_1 &= 4 \end{aligned}$$

The above system is:

A. inconsistent

B. consistent with infinitely many solutions

C. consistent with a unique solution

D. None of these.

8. Consider $\left[\begin{array}{ccc|c} 2 & 0 & 6 & 0 \\ 0 & 3 & -6 & 0 \\ 0 & 0 & 0 & 0 \end{array}\right]$. If this is an augmented matrix, the solution set of the linear system is

A. $\{(-3t, 2t, t) : t \in \mathbb{R}\}$

B. $\{(-3, 2, 1)\}$

C. $\{(3t, -2t, -t) : t \in \mathbb{R}\}$

D. $\{(-6t, 6t, 0) : t \in \mathbb{R}\}$

E. None of these.