King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 101 (131) - Quiz 1

Name: ID: Serial No.:

1. Using Gauss-Jordan method to solve the following two systems

$$\begin{aligned} x_1 + 2x_2 - x_3 &= 1 \\ 2x_1 - x_2 + x_3 &= 3 \\ -x_1 + 2x_2 + 3x_3 &= 7 \end{aligned} \quad \text{and} \quad \begin{aligned} x_1 + 2x_2 - x_3 &= 0 \\ 2x_1 - x_2 + x_3 &= 3 \\ -x_1 + 2x_2 + 3x_3 &= 2 \end{aligned}$$

2. Compute the LU factorization of $\begin{bmatrix} 1 & 1 & 1 \\ 3 & 5 & 6 \\ -2 & 2 & 7 \end{bmatrix}$

3. Prove that if A is nonsingular matrix, then A^T is nonsingular and

$$(A^T)^{-1} = (A^{-1})^T$$

[Hint: $(AB)^T = B^T A^T$]