Sample of first 313 midterm test
This is only a Sample Test for preparing the first midterm test. It should be submitted nowhere, it is only for practising purposes.

1. Solve the following systems by Gauss-Jordan elimination:

$$\begin{aligned} x_1 \ + \ x_2 \ + 2x_3 &= 8 \\ -x_1 - 2x_2 + 3x_3 &= 1 \\ 3x_1 - 7x_2 + 4x_3 &= 10 \end{aligned} \qquad\qquad \begin{aligned} 2x_1 - 3x_2 &= -2 \\ 2x_1 \ + \ x_2 &= \ \ 1 \\ 3x_1 + 2x_2 &= \ \ 1 \end{aligned}$$

2. Compute $(7A)^{-1}$, where $A = \begin{pmatrix} 3 & 1 \\ 5 & 2 \end{pmatrix}$.

3. Consider matrix $A = \begin{pmatrix} 1 & 0 \\ -5 & 2 \end{pmatrix}$. Find elementary matrices E_1 and E_2 such that $E_2E_1A = I$.

4. Find the inverse of $A = \begin{pmatrix} 1 & 0 & 1 \\ -1 & 1 & 1 \\ 0 & 1 & 0 \end{pmatrix}$ by Gauss-Jordan elimination.

5. Find the determinant of matrix $\begin{pmatrix} 1 & -3 & 0 \\ -2 & 4 & 1 \\ 5 & -2 & 2 \end{pmatrix}$ by Gauss elimination.

6. Find the inverse of $\begin{pmatrix} 2 & 0 & 0 \\ 8 & 1 & 0 \\ -5 & 3 & 6 \end{pmatrix}$ by the cofactor formula.

7. Solve

$$\begin{aligned} 4x + 5y \ \ \ \ \ &= 2 \\ 11x + y + 2z &= 3 \\ x + 5y + 2z &= 1 \end{aligned}$$

by Cramer's rule.