Math 221-AB1: Quiz 1

1. (*3 pts*) Determine the elementary matrix E such that EB has a zero in the third row, second column.

$$B = \begin{bmatrix} 2 & 6 & 4 \\ 4 & -1 & 3 \\ -1 & 3 & 1 \end{bmatrix}$$

2. (*3 pts*) Suppose we know that

$$C^{-1} = \begin{bmatrix} 1 & 1 & 2 \\ 0 & k & 1 \\ 4 & 2 & -1 \end{bmatrix}$$

   (a) Find a matrix D so that $CD = \begin{bmatrix} 1 & 1 \\ 0 & 1 \\ 2 & -1 \end{bmatrix}$.

3. (*4 pts*) Solve the linear system $Ax = b$ with $A = LU$ where L, U, and b given as

$$L = \begin{bmatrix} 1 & 0 \\ 2 & 1 \end{bmatrix} \quad U = \begin{bmatrix} 2 & -1 & 1 \\ 0 & 0 & 3 \end{bmatrix} \quad b = \begin{bmatrix} 1 \\ 8 \end{bmatrix}$$

   Do not reconstruct A and perform elimination. Make use of the factorization.