Let $A = \begin{bmatrix} 2 & 0 & 1 \\ -4 & -1 & -1 \\ 6 & -4 & 10 \end{bmatrix}$ and $\vec{b} = \begin{bmatrix} -1 \\ 1 \\ -4 \end{bmatrix}$.

a. (5 points) Compute the LU-decomposition of A.

b. (5 points) Use the LU-decomposition to solve the equation $A\vec{x} = \vec{b}$.