

## 1. Elementary Matrices

a) i)  $\begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$       ii)  $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -5 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$

iii)  $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 3 & 0 & 1 \end{bmatrix}$       iv)  $\begin{bmatrix} 1 & -1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 3 & 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & -1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} 1 & -1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 3 & 0 & 1 \end{bmatrix}$$

b)  $EA = \begin{bmatrix} 6 & 10 & -5 & -5 \\ 0 & 1 & 0 & 0 \\ 6 & 14 & -7 & -6 \\ 1 & 2 & -1 & -1 \end{bmatrix} \begin{bmatrix} 1 & 0 & 0 & -5 & 15 \\ 0 & 1 & 0 & 0 & -7 \\ 0 & 2 & -1 & 6 & 3 \\ 1 & 0 & 1 & -12 & -5 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 & 30 \\ 0 & 1 & 0 & 0 & -7 \\ 0 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 3 \end{bmatrix}$

$$\begin{bmatrix} b_1 \\ b_2 \\ b_3 \\ b_4 \end{bmatrix} = \begin{bmatrix} 30 \\ -7 \\ 1 \\ 3 \end{bmatrix}$$

## 2. Homework Process

I worked on this homework alone. I knew about elementary matrices before, so I was able to do it without reading any notes.