MH1200 Quiz 2

September 15, 2016

Problem 1. Let

$$A = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & 3 \\ 0 & 2 & 4 \end{bmatrix} .$$

Give an elementary matrix E such that EA is upper triangular.

1 0 0
0 1 0
0 -2 1

Problem 2. Determine the values of b for which the system of linear equations

$$\begin{bmatrix} 1 & 1 & 1 \\ 1 & 3 & 5 \\ 2 & 0 & -2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 1 \\ b \\ 2 \end{bmatrix}$$

has a solution.

1 1 1 1
0 2 4 b-1
0-2-4 0

→

1 1 1 1
0 2 4 b-1
0 0 0 b-1

The system will have infinitely many solutions if b is equal to 1