

### Supplementary homework problems for week 1.

1. Describe an elementary row operation that produces  $C$  from  $B$ , and then describe an elementary row operation that recovers  $B$  from  $C$ .

$$(a) \quad B = \begin{bmatrix} 2 & 0 & -4 \\ -3 & -2 & 6 \\ 2 & 5 & 1 \end{bmatrix}, C = \begin{bmatrix} 2 & 5 & 1 \\ -3 & -2 & 6 \\ 2 & 0 & -4 \end{bmatrix}$$

$$(b) \quad B = \begin{bmatrix} 2 & 0 & -4 \\ -3 & -2 & 1 \\ 2 & 0 & 3 \end{bmatrix}, C = \begin{bmatrix} 2 & 0 & -4 \\ -3 & -2 & 1 \\ 10 & 0 & 15 \end{bmatrix}$$

2. Find the solution set to the given linear systems, and then check your solutions (by substituting your found values to verify they are correct):

(a)

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

(b)

$$\begin{aligned} 2x_1 + 2x_2 + 2x_3 &= 0 \\ -2x_1 + 5x_2 + 2x_3 &= 1 \\ 8x_1 + x_2 + 4x_3 &= -1 \end{aligned}$$