CS 6505 - Homework 6

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$$\left[\begin{array}{ccc|c} 4 & 2 & 0 & 1 \\ 0 & 2 & 1 & 2 \\ 1 & 0 & 1 & 0 \end{array}\right] \tag{1}$$

Switch row two and row three.

$$\left[\begin{array}{ccc|c} 1 & 0 & 1 & 0 \\ 0 & 2 & 1 & 2 \\ 4 & 2 & 0 & 1 \end{array}\right] \tag{2}$$

$R_3 = R_3 - 4R_1$.

$$\left[\begin{array}{ccc|c} 1 & 0 & 1 & 0 \\ 0 & 2 & 1 & 2 \\ 0 & 2 & -4 & 1 \end{array}\right] \tag{3}$$

$R_3 = R_3 - R_2$.

$$\left[\begin{array}{ccc|c} 1 & 0 & 1 & 0 \\ 0 & 2 & 1 & 2 \\ 0 & 0 & -5 & -1 \end{array}\right] \tag{4}$$

$R_2 = \frac{1}{2}R_2$.
$R_3 = \frac{-1}{5}R_3$.

$$\left[\begin{array}{ccc|c} 1 & 0 & 1 & 0 \\ 0 & 1 & \frac{1}{2} & 1 \\ 0 & 0 & 1 & \frac{1}{5} \end{array}\right] \tag{5}$$

$R_2 = R_2 - \frac{1}{2}R_3$.
$R_1 = R_1 - R_3$.

$$\left[\begin{array}{ccc|c} 1 & 0 & 0 & \frac{-1}{5} \\ 0 & 1 & 0 & \frac{9}{10} \\ 0 & 0 & 1 & \frac{1}{5} \end{array}\right] \tag{6}$$

So, $x_1 = \frac{-1}{5}$, $x_2 = \frac{9}{10}$, and $x_3 = \frac{1}{5}$.