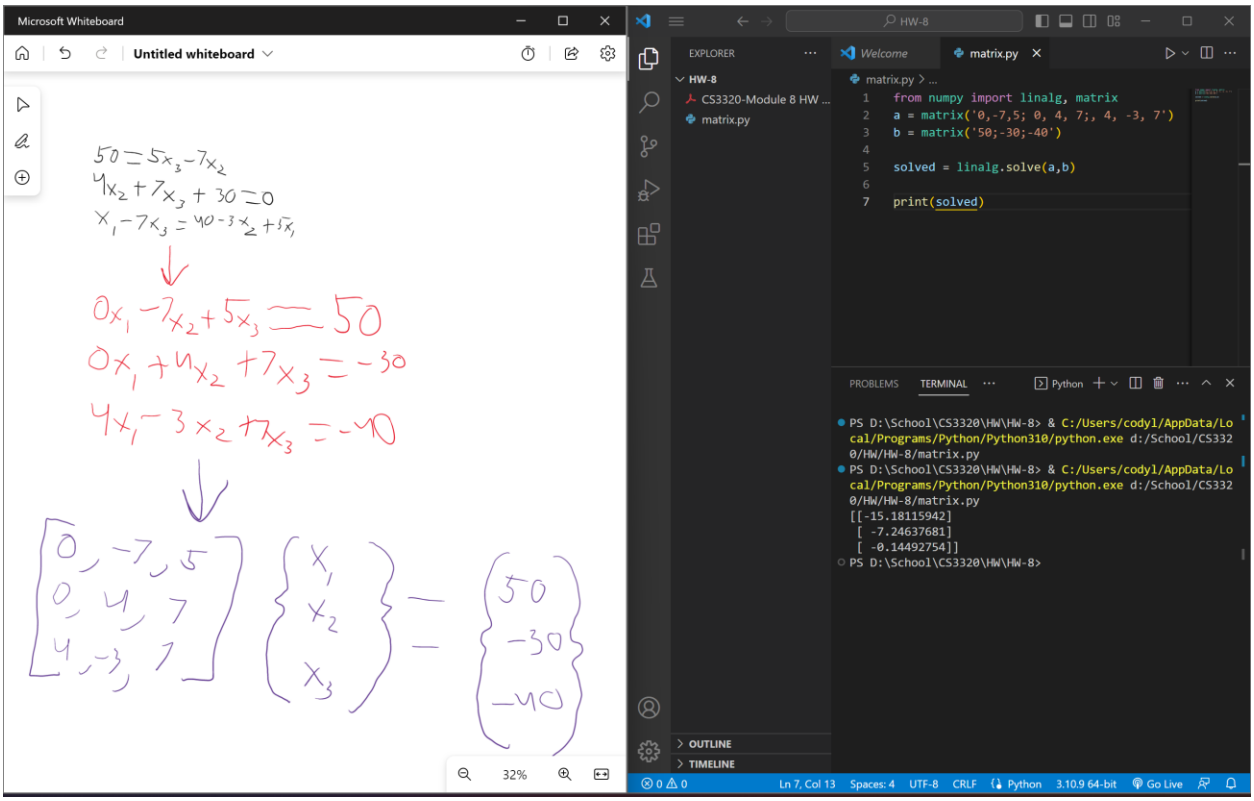
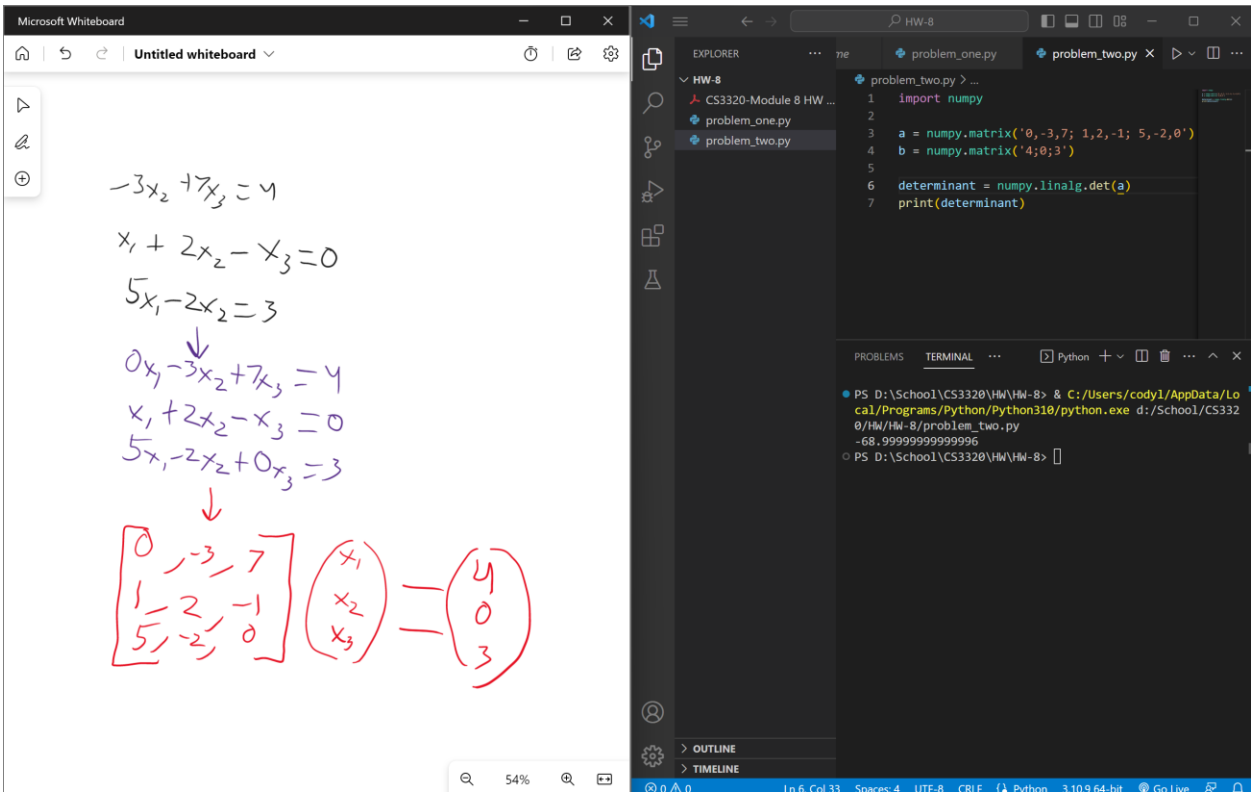
Assignment: Homework Eight Name: Cody Strange
Disclaimer: This is my work, not that of others
Total Score: 50 (in points, not percentage)

Problem 1 score: 10
Problem 2 score: 30
Problem 3 score: 10

1. 

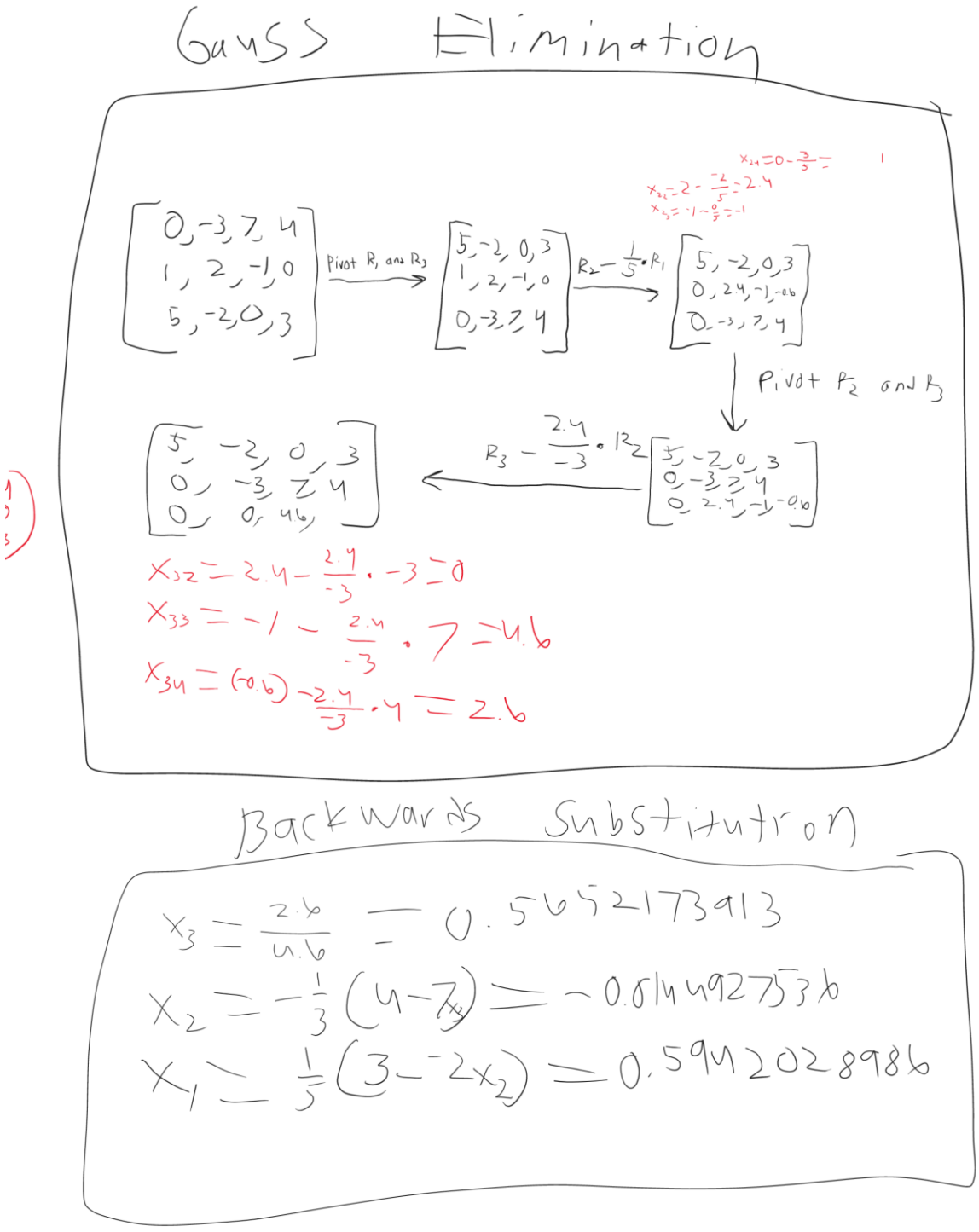
x1 = -1518115942, x2 = -7.24637681, x3 = -0.14492754

2. A. ete



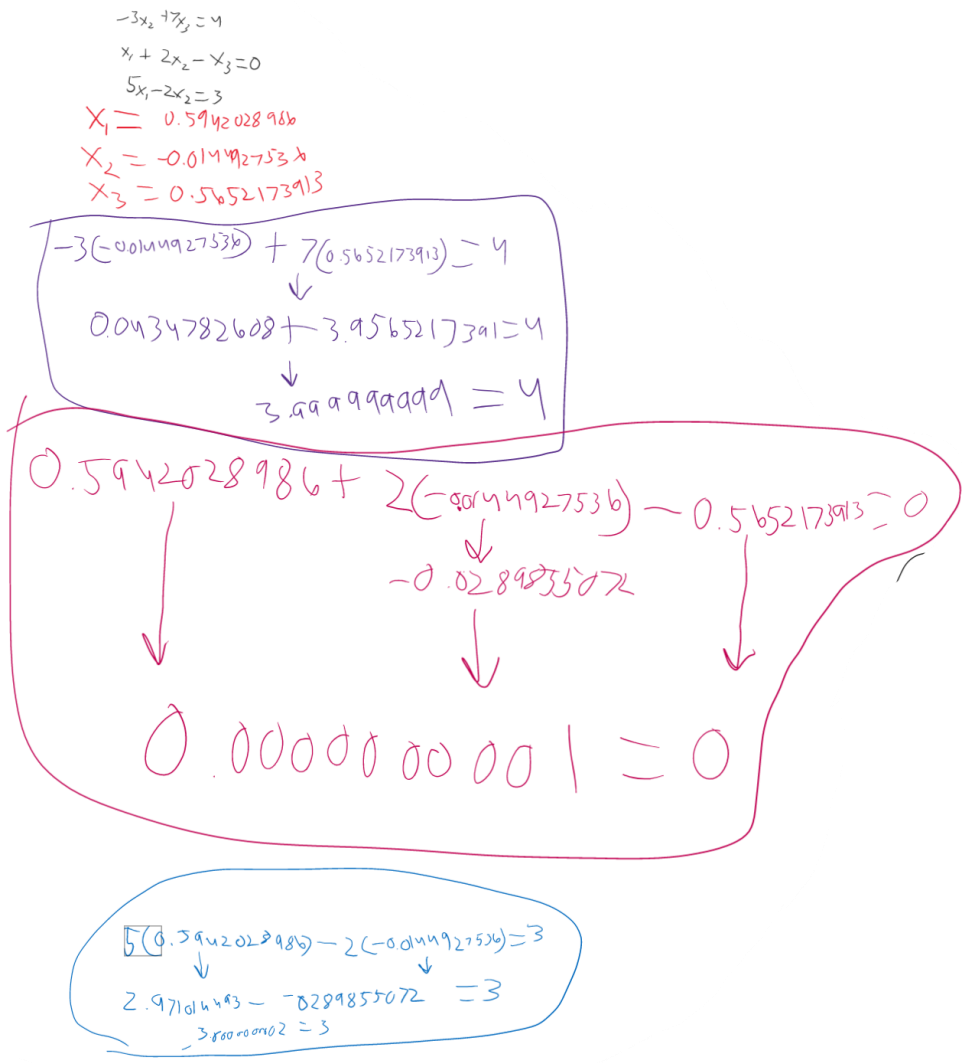
Determinant = -68.9999999999999996

B.

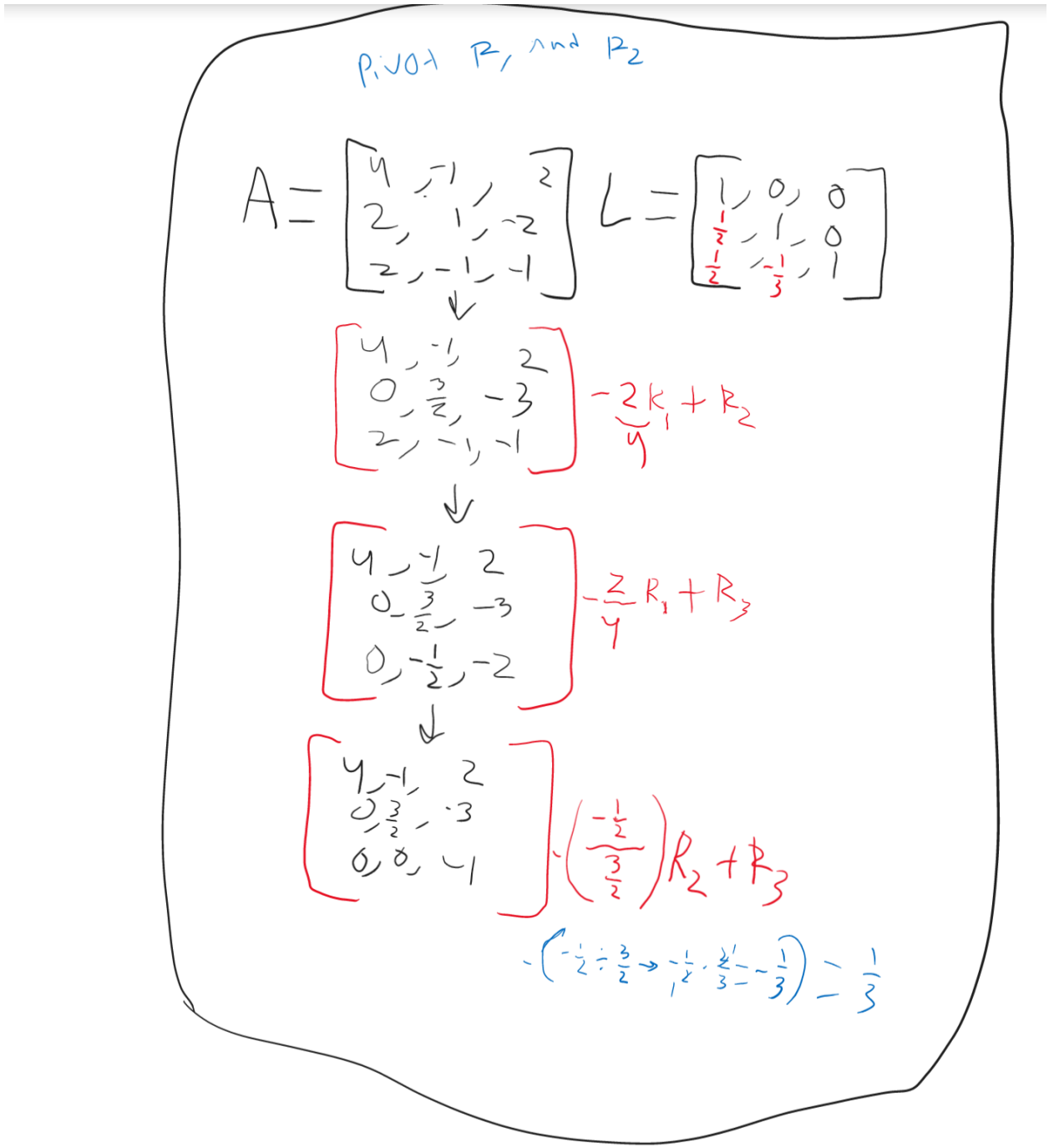


x3 = 0.5652173913
x2 = -0.0144927536
x1 = 0.5942028986

C.


$-3x_2 + 7x_3 = 4$
$x_1 + 2x_2 - x_3 = 0$
$5x_1 - 2x_2 = 3$
$X_1 = 0.594202898$
$X_2 = -0.014492754$
$X_3 = 0.565217391$
$-3(-0.014492754) + 7(0.565217391) = 4$
$0.043478261 + 3.956521739 = 4$
$4.000000000 = 4$
$0.594202898 + 2(-0.014492754) - 0.565217391 = 0$
-0.028985508
$0.000000001 = 0$
$5(0.594202898) - 2(-0.014492754) = 3$
$2.971014493 - -0.028985508 = 3$
$3.000000002 = 3$

3.


Pivot R_1 and R_2
$A = \begin{bmatrix} 4 & -1 & 2 \\ 2 & 1 & -2 \\ 2 & -1 & -1 \end{bmatrix}$
$L = \begin{bmatrix} 1 & 0 & 0 \\ \frac{1}{2} & 1 & 0 \\ \frac{1}{2} & -\frac{1}{3} & 1 \end{bmatrix}$
$\begin{bmatrix} 4 & -1 & 2 \\ 0 & \frac{3}{2} & -3 \\ 2 & -1 & -1 \end{bmatrix}$
$-\frac{2}{4}R_1 + R_2$
$\begin{bmatrix} 4 & -1 & 2 \\ 0 & \frac{3}{2} & -3 \\ 0 & -\frac{1}{2} & -2 \end{bmatrix}$
$-\frac{2}{4}R_1 + R_3$
$\begin{bmatrix} 4 & -1 & 2 \\ 0 & \frac{3}{2} & -3 \\ 0 & 0 & 4 \end{bmatrix}$
$-\left(\frac{-\frac{1}{2}}{\frac{3}{2}}\right)R_2 + R_3$
$-\left(-\frac{1}{2} \div \frac{3}{2} \rightarrow -\frac{1}{2} \cdot \frac{2}{3} = -\frac{1}{3}\right) = \frac{1}{3}$

$$B = \begin{bmatrix} 5 \\ 1 \\ 2 \end{bmatrix}$$

$$L = \begin{bmatrix} 1 & 0 & 0 \\ \frac{1}{2} & 1 & 0 \\ \frac{1}{2} & -\frac{1}{3} & 1 \end{bmatrix} \begin{bmatrix} y_1 \\ y_2 \\ y_3 \end{bmatrix} = \begin{bmatrix} 5 \\ 1 \\ 2 \end{bmatrix}$$

$$y_1 = 5$$

$$\frac{1}{2}y_1 + y_2 = 1$$

$$\frac{1}{2}y_1 - \frac{1}{3}y_2 + y_3 = 2$$

$\frac{1}{2}(5) + y_2 = 1$

$\frac{5}{2} + y_2 = 1$

$-\frac{3}{2} + y_2 = 0$

$y_2 = \frac{3}{2}$

$\frac{1}{2}(5) - \frac{1}{3}\left(\frac{3}{2}\right) + y_3 = 2$

$\frac{5}{2} + \frac{3}{6} + y_3 = 2$

-2

$\frac{1}{2} + \frac{1}{2} + y_3 = 0$

$1 + y_3 = 0$

-1

$y_3 = -1$

$y_1 = 5$

$y_2 = -\frac{3}{2}$

$y_3 = -1$

$$U = \begin{bmatrix} 4 & -1 & 2 \\ 0 & \frac{3}{2} & -3 \\ 0 & 0 & 4 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 5 \\ -\frac{3}{2} \\ -1 \end{bmatrix}$$

$4x_1 - x_2 + 2x_3 = 5$

$\frac{3}{2}x_2 - 3x_3 = -\frac{3}{2}$

$-x_3 = -1$

$x_3 = 1$

$x_2 = 1$

$x_1 = 1$

$\frac{3}{2}x_2 - 3 + 3 = -\frac{3}{2}$

$\frac{3}{2}x_2 = 3 - \frac{3}{2}$

$\frac{2}{3}$

$x_2 = \frac{2}{3}\left(3 - \frac{3}{2}\right)$

$= 2 - 1 = 1$

$4x_1 - 1 + 2 = 5$

$4x_1 + 1 = 5$

$-1 \quad -1$

$\frac{4x_1}{4} = \frac{4}{4}$

$x_1 = 1$

$$B = \begin{bmatrix} 6 \\ 0 \\ 3 \end{bmatrix}$$

$$L = \begin{bmatrix} 1 & 0 & 0 \\ \frac{1}{2} & 1 & 0 \\ \frac{1}{2} & -\frac{1}{3} & 1 \end{bmatrix} \begin{bmatrix} y_1 \\ y_2 \\ y_3 \end{bmatrix} = \begin{bmatrix} 6 \\ 0 \\ 3 \end{bmatrix}$$

$y_1 = 6$

$\frac{1}{2}y_1 + y_2 = 0$ $\quad \frac{1}{2}(6) + y_2 = 0$

$3 + y_2 = 0$

$-3 \quad -3$

$y_2 = -3$

$\frac{1}{2}y_1 - \frac{1}{3}y_2 + y_3 = 3$ $\quad \frac{1}{2}(6) - \frac{1}{3}(-3) + y_3 = 3$

$3 + 1 + y_3 = 3$

$-3 \quad -1 \quad -4$

$y_3 = -1$

$y_1 = 6$

$y_2 = -3$

$y_3 = -1$

$$U = \begin{bmatrix} 4 & -1 & 2 \\ 0 & \frac{3}{2} & -3 \\ 0 & 0 & -1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 6 \\ -3 \\ -1 \end{bmatrix}$$

$4x_1 - 1x_2 + 2x_3 = 6$

$\frac{3}{2}x_2 - 3x_3 = -3$

$-x_3 = -1$

$\frac{3}{2}(x_2) - 3(1) = -3$

$+3 \quad +3$

$\frac{3}{2}(x_2) = 0$

$x_2 = 0$

$x_3 = 1$

$x_2 = 0$

$x_1 = 1$

$4(x_1) - 1(-2) + 2(0) = 6$

$4(x_1) + 2 = 6$

$-2 \quad -2$

$\frac{4(x_1)}{4} = \frac{4}{4}$

$x_1 = 1$