FIND SOLN TO

$Ax = b$

→ APPLY ALL PERMUTATION & ANNIHILATION MATRICES TO b AS A WAS

$M_2 P_2 M_1 P_1 b = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & -2/11 & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{bmatrix} \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ -1/5 & 3/5 & 1 \end{bmatrix} \begin{bmatrix} 2 \\ 1 \\ -2 \end{bmatrix}$

$= \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & -2/11 & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{bmatrix} \begin{bmatrix} 2 \\ -8/5 \\ 11/5 \end{bmatrix}$

$= \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & -2/11 & 1 \end{bmatrix} \begin{bmatrix} 2 \\ 11/5 \\ -8/5 \end{bmatrix}$

$= \begin{bmatrix} 2 \\ 11/5 \\ -2/11 \end{bmatrix}$

$Ux = y$

$\begin{bmatrix} -5 & 2 & -1 \\ 0 & 11/5 & 23/5 \\ 0 & 0 & 20/11 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 2 \\ 1/5 \\ 58/55 \end{bmatrix}$

$x_3 = \frac{11}{20} \frac{58}{55} = 0.58$

$\frac{1}{5} x_2 + \frac{27}{5} \cdot 0.58 = \frac{7}{5}$

$x_2 = \left(\frac{7}{5} - \frac{27}{5} \cdot 0.58 \right) \Big/ 11/5$

$x_2 \approx -0.7873$

$-5x_3 + 2 \cdot (-0.7873) - (0.58) = 2$

$x_3 = \left[2 - (2 \cdot (-0.7873)) + 0.58 \right] \left[\frac{1}{-5} \right]$

$x_3 \approx -0.831$

$Ly = Pb$

$\begin{bmatrix} 1 & 0 & 0 \\ -1/5 & 1 & 0 \\ -3/5 & 2/11 & 1 \end{bmatrix} \begin{bmatrix} y_1 \\ y_2 \\ y_3 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{bmatrix} \begin{bmatrix} 2 \\ -2 \\ 1 \end{bmatrix} = \begin{bmatrix} 2 \\ 1 \\ -2 \end{bmatrix}$

$y_1 = 2$

$-1/5 \cdot 2 + y_2 = 1$

$y_2 = 1 - (-2/5) = 7/5$

$-\frac{3}{5} \cdot 2 + \frac{3}{11} \cdot \frac{7}{5} + y_3 = -2$

$y_3 = -2 - \left(-\frac{6}{5} \right) - \left(\frac{21}{11} \cdot \frac{7}{5} \right)$

$= -\frac{10}{5} + \frac{6}{5} - \frac{14}{55}$

$= -\frac{44}{55} - \frac{14}{55} = -\frac{58}{55}$

$y_3 = 58/55$

B.S. PHYSICS
MINORS IN,
CHEMISTRY
& MATHEMATICS