

SOLVE

$$A x = \begin{bmatrix} 0 \\ 1 \\ 5 \end{bmatrix}$$

$$A = \begin{bmatrix} -5 & 2 & 1 \\ 1 & 0 & 3 \\ 3 & 1 & 6 \end{bmatrix}$$

$$P = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{bmatrix}$$

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

$$V = \begin{bmatrix} -5 & 2 & 1 \\ 0 & 1/5 & 27/5 \\ 0 & 0 & 20/11 \end{bmatrix}$$

$$-\frac{1}{5}(0) + \frac{2}{11}(5) + \frac{1}{11} = \frac{10}{11} + \frac{1}{11} = 1 \checkmark$$

2. Solve

$$U x = y$$

$$\begin{bmatrix} -5 & 2 & 1 \\ 0 & 1/5 & 27/5 \\ 0 & 0 & 20/11 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 5 \\ 1 \\ 11 \end{bmatrix}$$

$$\frac{20}{11} x_3 = \frac{1}{11} \rightarrow x_3 = \frac{1}{20} = x_3$$

$$\frac{11}{5} x_2 + \frac{27}{5} x_3 = 5$$

$$x_2 = \left( 5 - \frac{27}{5} \cdot \frac{1}{20} \right) \frac{5}{11} = 2.15 = x_2$$

$$\frac{11}{5} \cdot 2.15 + \frac{27}{5} \cdot \frac{1}{20} =$$

SOLVE

$$L y = P b$$

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

$$= \begin{bmatrix} 1 \\ 0 \\ 5 \end{bmatrix}$$

$$y_1 = 1$$

$$-\frac{3}{5} y_1 + y_2 = 5 \rightarrow y_2 = 5 + \frac{3}{5} y_1 = 5 = y_2$$

$$-\frac{1}{5} y_1 + \frac{2}{11} y_2 + y_3 = 1 \rightarrow y_3 = 1 + \frac{1}{5} y_1 - \frac{2}{11} y_2$$

$$= 1 - \frac{2}{11} \cdot 5 = \frac{1}{11} - \frac{10}{11} = -\frac{9}{11} = y_3$$

$$-5 \cdot (0.85) + 2 \cdot (2.15) - \frac{1}{20} =$$

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MINORS IN  
CHEMISTRY  
& MATHEMATICS

$$-5x_1 + 2x_2 - x_3 = 0$$

$$x_1 = (x_3 - 2x_2) \left( -\frac{1}{5} \right)$$

$$= \left( \frac{1}{20} - 2 \cdot 2.15 \right) \left( -\frac{1}{5} \right) = 0.85 = x_1$$