

A = LU
 IN EXAMPLE 2.16:

$$PA = LU = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0.5 & 0.5 & 1 \end{bmatrix} \begin{bmatrix} 4 & 4 & 2 \\ 0 & 2 & 2 \\ 0 & 0 & 0.5 \end{bmatrix}$$

FIRST SOLVE z IN

$$Lz = Pb$$

$$P = P_2 P_1 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$Pb = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 3 \\ 6 \\ 10 \end{bmatrix} = \begin{bmatrix} 6 \\ 3 \\ 10 \end{bmatrix}$$

$$Lz = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0.5 & 0.5 & 1 \end{bmatrix} \begin{bmatrix} z_1 \\ z_2 \\ z_3 \end{bmatrix} = \begin{bmatrix} 6 \\ 3 \\ 10 \end{bmatrix}$$

$$\boxed{z_1 = 6}$$

$$z_1 + z_2 = 10$$

$$\boxed{z_2 = 10 - 6 = 4}$$

$$\frac{1}{4}z_1 + 0.5z_2 + z_3 = 3$$

$$z_3 = 3 - \frac{1}{4} \cdot 6 - 0.5 \cdot 3$$

$$\boxed{z_3 = 0}$$

$$Ux = z = \begin{bmatrix} 4 & 4 & 2 \\ 0 & 2 & 2 \\ 0 & 0 & 0.5 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 6 \\ 4 \\ 0 \end{bmatrix}$$

$$\boxed{x_3 = 0}$$

$$x_2 \cdot 2 = 4$$

$$\boxed{x_2 = 2}$$

$$x_1 \cdot 4 + 4x_2 + 2x_3 = 6$$

$$\boxed{x_1} = 6 - 4 \cdot 2 + 2 \cdot 0$$

$$= \frac{6 - 8}{-2} = 1$$

B.S. PHYSICS
 MINORS IN
 CHEMISTRY
 & MATHEMATICS