S07 A2

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a)
$$\left(\begin{array}{ccc|c} 0.8 & 2.2 & 3.6 & 2.4 \\ 2.0 & 3.0 & 4.0 & 1.0 \\ 1.2 & 2.0 & 5.8 & 4.0 \end{array}\right) \xrightarrow{\cdot(-0.4),\ \cdot(-0.6)} \left(\begin{array}{ccc|c} 2.0 & 3.0 & 4.0 & 1.0 \\ 0.8 & 2.2 & 3.6 & 2.4 \\ 1.2 & 2.0 & 5.8 & 4.0 \end{array}\right)$$

z_1, $z_2 - 0.4 z_1$, $z_3 - 0.6 z_1$

$$\left(\begin{array}{ccc|c} 2.0 & 3.0 & 4.0 & 1.0 \\ 0 & 1 & 2 & 2 \\ 0 & 0.2 & 3.4 & 3.4 \end{array}\right) \xrightarrow{\cdot(-0.2)} \left(\begin{array}{ccc|c} 2.0 & 3.0 & 4.0 & 1.0 \\ 0 & 1 & 2 & 2 \\ 0 & 0 & 3 & 3 \end{array}\right) = R$$

z_1, z_2, $z_3 - 0.2 z_2$

$$x_1 = \frac{1-4}{2} = -1.5$$
$$x_2 = \frac{2-2}{1} = 0$$
$$x_3 = \frac{3}{3} = 1$$

$$L = \begin{pmatrix} 1 & 0 & 0 \\ * & 1 & 0 \\ * & * & 1 \end{pmatrix} \rightarrow \begin{pmatrix} 1 & 0 & 0 \\ 0.4 & 1 & 0 \\ 0.6 & 0.2 & 1 \end{pmatrix} = L$$

$$\mathbb{1} = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \xrightarrow{z_1 \leftrightarrow z_2} \begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix} = P$$

b) $Ly = Pb$

$$\begin{pmatrix} 1 & 0 & 0 \\ 0.4 & 1 & 0 \\ 0.6 & 0.2 & 1 \end{pmatrix} \cdot y = \begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix} \cdot \begin{pmatrix} 2.4 \\ 1.0 \\ 4.0 \end{pmatrix}$$

$$\left(\begin{array}{ccc|c} 1 & 0 & 0 & 1.0 \\ 0.4 & 1 & 0 & 2.4 \\ 0.6 & 0.2 & 1 & 4.0 \end{array}\right) \xrightarrow{\cdot(-0.4),\ \cdot(-0.6)} \left(\begin{array}{ccc|c} 1 & 0 & 0 & 1.0 \\ 0 & 1 & 0 & 2 \\ 0 & 0.2 & 1 & 3.4 \end{array}\right) \xrightarrow{\cdot(-0.2)}$$

$$\left(\begin{array}{ccc|c} 1 & 0 & 0 & 1.0 \\ 0 & 1 & 0 & 2 \\ 0 & 0 & 1 & 3 \end{array}\right) \qquad y = \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}$$

$R \cdot x = y$

$$\left(\begin{array}{ccc|c} 2.0 & 3.0 & 4.0 & 1 \\ 0 & 1 & 2 & 2 \\ 0 & 0 & 3 & 3 \end{array}\right)$$

$x_3 = \frac{1 - 0 - 2}{2} = -1.5$

$x_2 = 2 - 2 = 0$

$x_3 = \frac{3}{3} = 1$