

2) a)

$$\begin{array}{ccc|ccc|ccc}
 & A & & P & & L & & & \\
 0.8 & 2.2 & 3.6 & 1 & 0 & 0 & * & * & * \\
 2 & 3 & 4 & 0 & 1 & 0 & * & * & * \\
 1.2 & 2 & 5.8 & 0 & 0 & 1 & * & * & *
 \end{array}$$

$$\begin{array}{ccc|ccc|ccc}
 2 & 3 & 4 & 0 & 1 & 0 & * & * & * \\
 0.8 & 2.2 & 3.6 & 1 & 0 & 0 & * & * & * \\
 1.2 & 2 & 5.8 & 0 & 0 & 1 & * & * & *
 \end{array}$$

$$\begin{array}{l}
 \downarrow (-\frac{2}{5}I) \\
 \downarrow (\frac{3}{5}I)
 \end{array}
 \begin{array}{ccc|ccc|ccc}
 2 & 3 & 4 & 0 & 1 & 0 & * & * & * \\
 0 & 1 & 2 & 1 & 0 & 0 & \frac{2}{5} & * & * \\
 0 & 0.2 & 3.4 & 0 & 0 & 1 & \frac{3}{5} & * & *
 \end{array}$$

$$\begin{array}{l}
 \downarrow (-\frac{1}{5}I)
 \end{array}
 \begin{array}{ccc|ccc|ccc}
 2 & 3 & 4 & 0 & 1 & 0 & 1 & 0 & 0 \\
 0 & 1 & 2 & 1 & 0 & 0 & \frac{2}{5} & 1 & 0 \\
 0 & 0 & 3 & 0 & 0 & 1 & \frac{3}{5} & \frac{1}{5} & 1
 \end{array}$$

$\underbrace{\hspace{10em}}_R \quad \underbrace{\hspace{10em}}_P \quad \underbrace{\hspace{10em}}_L$

$$LA = PA = \begin{pmatrix} 2 & 3 & 4 \\ 0.8 & 2.2 & 3.6 \\ 1.2 & 2 & 5.8 \end{pmatrix}$$

$$b) \quad b = \begin{pmatrix} 2.4 \\ 1 \\ 4 \end{pmatrix}$$

$$P \cdot b = \begin{pmatrix} 1 \\ 2.4 \\ 4 \end{pmatrix} = L \cdot y$$

$$\begin{array}{ccc|ccc|ccc} 1 & 0 & 0 & 1 & & 1 & 0 & 0 & 1 & & \\ \frac{2}{5} & 1 & 0 & 2.4 & & 0 & 1 & 0 & 2 & & \\ \frac{3}{5} & \frac{1}{5} & 1 & 4 & & 0 & \frac{1}{5} & 1 & 3.4 & & \end{array}$$

$$\begin{array}{ccc|c} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 2 \\ 0 & 0 & 1 & 3 \end{array}$$

$$R_x = y$$

$$\begin{array}{ccc|c} 2 & 3 & 4 & 1 \\ 0 & 1 & 2 & 2 \\ 0 & 0 & 3 & 3 \end{array}$$

$$x_3 = 1$$

$$x_2 + 2 = 2 \Rightarrow x_2 = 0$$

$$2x_1 + 4 = 1 \Rightarrow x_1 = -\frac{3}{2} = -1.5$$

$$\Rightarrow x = \begin{pmatrix} -1.5 \\ 0 \\ 1 \end{pmatrix}$$