

$$2. \quad (a) \quad A = \begin{pmatrix} -1 & -1 & 3 \\ 5 & 1 & -1 \\ 1 & -3 & 1 \end{pmatrix}, \quad p = \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}$$

$$R = \begin{pmatrix} 5 & 1 & -1 \\ -1 & -1 & 3 \\ 1 & -3 & 1 \end{pmatrix}, \quad p = \begin{pmatrix} 2 \\ 1 \\ 3 \end{pmatrix}$$

$$R = \left(\begin{array}{ccc|ccc} 5 & 1 & -1 & & & \\ -\frac{1}{5} & -\frac{4}{5} & 2,8 & & & \\ \frac{1}{5} & -3,2 & 1,2 & & & \end{array} \right), \quad p = \begin{pmatrix} 2 \\ 1 \\ 3 \end{pmatrix} \quad \left(\frac{1}{2} \right)$$

$$R = \left(\begin{array}{ccc|ccc} 5 & 1 & -1 & & & \\ \frac{1}{5} & -\frac{16}{5} & \frac{6}{5} & & & \\ -\frac{1}{5} & -\frac{4}{5} & \frac{14}{5} & & & \end{array} \right), \quad p = \begin{pmatrix} 2 \\ 3 \\ 1 \end{pmatrix}$$

$$R = \left(\begin{array}{ccc|ccc} 5 & 1 & -1 & & & \\ \frac{1}{5} & -\frac{16}{5} & \frac{6}{5} & & & \\ -\frac{1}{5} & \frac{1}{4} & \frac{2}{5} & & & \end{array} \right), \quad p = \begin{pmatrix} 2 \\ 3 \\ 1 \end{pmatrix} \quad \left(\frac{1}{2} \right)$$

$$L = \begin{pmatrix} 1 & 0 & 0 \\ \frac{1}{5} & 1 & 0 \\ -\frac{1}{5} & \frac{1}{4} & 1 \end{pmatrix}, \quad U = \begin{pmatrix} 5 & 1 & -1 \\ 0 & -\frac{16}{5} & \frac{6}{5} \\ 0 & 0 & \frac{2}{5} \end{pmatrix}, \quad p = \begin{pmatrix} 2 \\ 3 \\ 1 \end{pmatrix} \quad \left(\frac{1}{2} \right)$$

$$b = (0, 1, 0)^t, \quad Pb = (1, 0, 0)^t$$