

C1)

$$\begin{pmatrix} 1 & 2 & -1 & 2 & 1 \\ 2 & 4 & 1 & -2 & 3 \\ 3 & 6 & 2 & -6 & 5 \end{pmatrix}$$

$$R_2 \rightarrow (-2)R_1 + R_2$$

$$R_3 \rightarrow (-3)R_1 + R_3$$

$$\begin{pmatrix} 1 & 2 & -1 & 2 & 1 \\ 0 & 0 & 3 & -6 & 1 \\ 0 & 0 & 5 & -12 & 2 \end{pmatrix}$$

$$R_3 \rightarrow -5R_2 + 3R_3$$

$$\begin{pmatrix} 1 & 2 & -1 & 2 & 1 \\ 0 & 0 & 3 & -6 & 1 \\ 0 & 0 & 0 & 6 & -1 \end{pmatrix}$$

$$\begin{array}{rrrr} 15 & -36 & 6 \\ 15 & -30 & 5 \\ \hline 0 & 6 & -1 \end{array}$$

$$R_3 \rightarrow \frac{1}{6}R_3$$

$$\begin{pmatrix} 1 & 2 & -1 & 2 & 1 \\ 0 & 0 & 3 & -6 & 1 \\ 0 & 0 & 0 & 1 & -\frac{1}{6} \end{pmatrix}$$

$$R_1 \rightarrow (-2)R_3 + R_1$$

$$R_2 \rightarrow 6R_3 + R_2$$

$$\begin{pmatrix} 1 & 2 & -1 & 0 & \frac{2}{3} \\ 0 & 0 & 3 & 0 & 0 \\ 0 & 0 & 0 & 1 & -\frac{1}{6} \end{pmatrix}$$

$$R_2 \rightarrow \frac{1}{3}R_2$$

$$\begin{pmatrix} 1 & 2 & -1 & 0 & \frac{2}{3} \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & -\frac{1}{6} \end{pmatrix}$$

$$R_1 \rightarrow R_1 + R_2$$

$$\begin{pmatrix} 1 & 2 & 0 & 0 & \frac{2}{3} \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & -\frac{1}{6} \end{pmatrix}$$

(2)

$$\begin{pmatrix} 2 & 3 & -2 & 5 & 1 \\ 3 & -1 & 2 & 0 & 4 \\ 4 & -5 & 6 & -5 & 7 \end{pmatrix}$$

$$R_1 \rightarrow \frac{1}{2}R_1$$

$$\begin{pmatrix} 1 & \frac{3}{2} & -1 & \frac{5}{2} & \frac{1}{2} \\ 3 & -1 & 2 & 0 & 4 \\ 4 & -5 & 6 & -5 & 7 \end{pmatrix}$$

$$R_2 \rightarrow (-3)R_1 + R_2$$

$$R_3 \rightarrow (-4)R_1 + R_3$$

$$\begin{pmatrix} 1 & \frac{3}{2} & -1 & \frac{5}{2} & \frac{1}{2} \\ 0 & -\frac{11}{2} & 5 & \frac{15}{2} & \frac{5}{2} \\ 0 & -11 & 10 & -15 & 5 \end{pmatrix}$$

$$R_3 \rightarrow (-2)R_2 + R_3$$

$$\begin{pmatrix} 1 & \frac{3}{2} & -1 & \frac{5}{2} & \frac{1}{2} \\ 0 & -\frac{11}{2} & 5 & \frac{15}{2} & \frac{5}{2} \\ 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$

$$R_2 \rightarrow (-\frac{2}{11})R_2$$

$$\begin{pmatrix} 1 & \frac{3}{2} & -1 & \frac{5}{2} & \frac{1}{2} \\ 0 & 1 & -\frac{10}{11} & -\frac{15}{11} & -\frac{5}{11} \\ 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$

$$R_1 \rightarrow (-\frac{3}{2})R_2 + R_1$$

$$\begin{pmatrix} 1 & 0 & -\frac{1}{11} & \frac{5}{11} & \frac{8}{11} \\ 0 & 1 & -\frac{10}{11} & -\frac{15}{11} & -\frac{5}{11} \\ 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$

$$\begin{pmatrix} 1 & 0 & -\frac{1}{11} & \frac{5}{11} & \frac{8}{11} \\ 0 & 1 & -\frac{10}{11} & -\frac{15}{11} & -\frac{5}{11} \\ 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$