

# LINAG 09

3.4.4.

$$a) \begin{pmatrix} 1 & 2 & 2 \\ 2 & 3 & 4 \\ 3 & 4 & 5 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \xrightarrow{\substack{-I \quad -II}} \begin{pmatrix} 1 & 1 & 0 \\ 2 & 1 & 1 \\ 3 & 1 & 1 \\ 1 & -1 & 0 \\ 0 & 1 & -1 \\ 0 & 0 & 1 \end{pmatrix} \xrightarrow{\substack{-2 \cdot III \quad -III}} \begin{pmatrix} 1 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 1 \\ 1 & -1 & 0 \\ 2 & 2 & -1 \\ -2 & -1 & 1 \end{pmatrix} \xrightarrow{\substack{-II}} \begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 1 \\ 2 & -1 & 0 \\ 0 & 2 & -1 \\ -1 & -1 & 1 \end{pmatrix} \xrightarrow{\substack{-I}} \begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \\ 2 & -1 & -2 \\ 0 & 2 & -1 \\ -1 & -1 & 2 \end{pmatrix} \xrightarrow{\substack{II \quad III \quad I}} \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \\ -1 & -2 & 2 \\ 2 & -1 & 0 \\ -1 & 2 & -1 \end{pmatrix}$$

$$A = \begin{pmatrix} -1 & -2 & 2 \\ 2 & -1 & 0 \\ -1 & 2 & -1 \end{pmatrix}$$

$$B = \begin{pmatrix} 3 & 5 & 3 \\ 2 & 3 & 2 \\ 1 & 1 & 2 \end{pmatrix}$$

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

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

$$A \cdot B = \begin{pmatrix} 4 & -5 & 3 \\ 2 & -3 & 2 \\ -1 & 1 & 0 \end{pmatrix}$$

$$b) \begin{pmatrix} 1 & 2 & 2 \\ 2 & 3 & 4 \\ 3 & 4 & 5 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \xrightarrow{\substack{-I \quad -II}} \begin{pmatrix} 1 & 1 & 0 \\ 2 & 1 & 1 \\ 3 & 1 & 1 \\ 1 & -1 & 0 \\ 0 & 1 & -1 \\ 0 & 0 & 1 \end{pmatrix} \xrightarrow{\substack{-II \quad -III}} \begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 1 \\ 2 & 0 & 1 \\ 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 1 \end{pmatrix} \xrightarrow{\substack{-III}} \begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 1 \\ 2 & -1 & 0 \\ 0 & 2 & -1 \\ -1 & -1 & 1 \end{pmatrix} \xrightarrow{\substack{-I}} \begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \\ 2 & -1 & -2 \\ 0 & 2 & -1 \\ -1 & -1 & 2 \end{pmatrix} \xrightarrow{\substack{II \quad III \quad I}} \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \\ -1 & -2 & 2 \\ 2 & -1 & 0 \\ -1 & 2 & -1 \end{pmatrix}$$

$$A = \begin{pmatrix} -1 & -2 & 2 \\ 2 & -1 & 0 \\ -1 & 2 & -1 \end{pmatrix}$$

$$B = \begin{pmatrix} 2 & 3 & 1 \\ 1 & 0 & 0 \\ 2 & 0 & 0 \end{pmatrix}$$

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

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

$$A \cdot B = \begin{pmatrix} 3 & -5 & 3 \\ -1 & -2 & 2 \\ -2 & -4 & 4 \end{pmatrix}$$