

14
21/2.8

$$\underline{\underline{B}} = \begin{vmatrix} 0 & -4 & 6 \\ 1 & -2 & 3 \\ 1 & 0 & 2 \end{vmatrix} = \begin{vmatrix} 1 & -2 & 3 \\ 0 & -4 & 6 \\ 1 & 0 & 2 \end{vmatrix} =$$

$$|A| = \begin{vmatrix} 5 & -4 \\ 1 & 2 \end{vmatrix} = 5 \cdot 2 - (-4) \cdot 1 = \underline{\underline{14}}$$

$$|A| = \begin{vmatrix} 5 & -4 \\ 1 & 2 \end{vmatrix} = \begin{vmatrix} 1 & 2 \\ 5 & -4 \end{vmatrix} = - \begin{vmatrix} 1 & 2 \\ 0 & -14 \end{vmatrix} = \underline{\underline{14}}$$

$\text{(I)} \leftrightarrow \text{(II)}$ $\text{(II)} - 5\text{(I)}$

$$= - \begin{vmatrix} 1 & -2 & 3 \\ 0 & -4 & 6 \\ 0 & 2 & -1 \end{vmatrix} = - \begin{vmatrix} 1 & -2 & 3 \\ 0 & -4 & 6 \\ 0 & 0 & 2 \end{vmatrix} =$$

$\text{(III)} - \text{(I)}$ $\text{(III)} + \frac{1}{2}\text{(II)}$

$$\underline{\underline{B}} = \begin{vmatrix} 0 & -4 & 6 \\ 1 & -2 & 3 \\ 1 & 0 & 2 \end{vmatrix} = 0 + (-12) + 0 - (-12) - (-8) - 0 = -(-8) = \underline{\underline{8}}$$

$\text{A} \perp \underline{\underline{B}}$

$$\begin{array}{c}
 \left(\begin{array}{cc} 1 & \\ 2 & 1/2.8 \end{array} \right) \\
 \boxed{D} = \left| \begin{array}{cccc} 1 & 1 & 1 & \dots & 1 \\ 1 & 0 & 1 & \dots & 1 \\ 1 & 1 & 0 & \dots & 1 \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ 1 & 1 & 1 & \dots & 0 \end{array} \right|_{n \times n} = \left| \begin{array}{ccccc} 1 & 1 & 1 & \dots & 1 \\ 0 & -1 & 0 & \dots & 0 \\ 0 & 0 & -1 & \dots & 0 \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & 0 & \dots & -1 \end{array} \right|_{n \times n} = (-1)^{n-1}
 \end{array}$$

$$\begin{array}{c}
 \rightarrow \left| \begin{array}{cccc} 1 & 2 & 3 & \dots & n \\ 1 & 2 & 3 & \dots & n \\ 3 & 4 & 5 & \dots & n+2 \\ \vdots & & & & \vdots \\ m & m+1 & m+2 & \dots & n \end{array} \right| \\
 \rightarrow \boxed{A} = \left| \begin{array}{ccccc} 1 & 2 & 3 & 4 & 5 \\ 2 & 3 & 4 & 5 & 1 \\ 3 & 4 & 5 & 1 & 2 \\ 4 & 5 & 1 & 2 & 3 \\ 5 & 1 & 2 & 3 & 4 \end{array} \right| \\
 \boxed{B} = \left| \begin{array}{ccccc} 2 & 3 & 4 & 5 & 1 \\ 1 & 2 & 3 & 4 & 5 \\ 3 & 4 & 5 & 1 & 2 \\ 4 & 5 & 1 & 2 & 3 \\ 5 & 1 & 2 & 3 & 4 \end{array} \right| \\
 -\boxed{A} = \left| \begin{array}{ccccc} 1 & 2 & 3 & 4 & 5 \\ 2 & 3 & 4 & 5 & 1 \\ 3 & 4 & 5 & 1 & 2 \\ 4 & 5 & 1 & 2 & 3 \\ 5 & 1 & 2 & 3 & 4 \end{array} \right|
 \end{array}$$

$$\frac{1}{2} \begin{vmatrix} 1 & 2 & 5 \\ 2 & 1 & 3 \\ 1 & 0 & 2 \end{vmatrix}$$

$$|A| = \begin{vmatrix} 6 & 4 \\ -3 & -2 \end{vmatrix} = -12 + 12 = 0$$

$$|A| = \begin{vmatrix} 6 & 4 \\ -3 & -2 \end{vmatrix} = \cancel{\begin{vmatrix} 6 & 4 \\ 0 & 0 \end{vmatrix}} = 0$$

$$|B| = \begin{vmatrix} -2 & 1 & 5 \\ -2 & -2 & 3 \\ 1 & 0 & 2 \end{vmatrix} = -\begin{vmatrix} 1 & 0 & 2 \\ -2 & -2 & 3 \\ -2 & 1 & 5 \end{vmatrix} = -\begin{vmatrix} 1 & 0 & 2 \\ 0 & -2 & 7 \\ 0 & 1 & 9 \end{vmatrix} =$$

$$\begin{array}{c} ((1)E7(1)) \\ ((1)H2(0)) \\ -+ \\ ((1)H((1))) \\ \hline \begin{vmatrix} 1 & 0 & 2 \\ 0 & 1 & 9 \\ 0 & -2 & 7 \end{vmatrix} = \begin{vmatrix} 8 & 0 & 1 \\ 0 & 1 & 9 \\ 0 & 0 & 0 \end{vmatrix} \\ ((1)H7(1)) \end{array}$$

$$8 + 3 + 0 + 10 + 4 + 0 = 25 \quad | = 25$$

$\begin{pmatrix} 1 \\ 2 \\ 1 \\ 2.5 \end{pmatrix}$

$$|\Sigma| = \begin{vmatrix} 4 & 3 & 2 & -1 \\ 1 & -3 & 0 & 2 \\ -1 & 3 & 1 & 1 \\ -1 & 2 & 0 & 3 \end{vmatrix} = 2 \cdot \begin{vmatrix} 1 & -3 & 2 \\ -1 & 3 & 1 \\ -1 & 2 & 3 \end{vmatrix} + 6 \cdot \begin{vmatrix} 4 & 3 & -1 \\ 1 & -3 & 2 \\ -1 & 2 & 3 \end{vmatrix} =$$

$$= 2 \cdot [0 + 3 + (-4) + 6 - 9 - 2] + 6 \cdot (-36 - 6 - 2 + 3 - 9 - 16) =$$
$$= 2 \cdot 3 + 6 \cdot (-66) = \underline{\underline{-390}}$$

1^k
2 1 / 2.5

$$|\Sigma| = \begin{vmatrix} 4 & 3 & 2 & -1 \\ 1 & -3 & 0 & 2 \\ -1 & 3 & 6 & 1 \\ -1 & 2 & 0 & 3 \end{vmatrix} = \begin{vmatrix} 1 & -3 & 0 & 2 \\ 4 & 3 & 2 & -1 \\ -1 & 3 & 6 & 1 \\ -1 & 2 & 0 & 3 \end{vmatrix} = \begin{vmatrix} 1 & -3 & 0 & 2 \\ 0 & 15 & 2 & -9 \\ 0 & 0 & 6 & 3 \\ 0 & -1 & 0 & 5 \end{vmatrix} =$$

$$= + \begin{vmatrix} 1 & -3 & 0 & 2 \\ 0 & -1 & 0 & 5 \\ 0 & 0 & 6 & 3 \\ 0 & 15 & 2 & -9 \end{vmatrix} \quad \begin{matrix} (I) \rightarrow (I) \\ (II) - 4(I) \\ (III) + (I) \\ (IV) + (II) \end{matrix} \quad \begin{matrix} (I) - 3(II) \\ 0 & -1 & 0 & 5 \\ 0 & 0 & 6 & 3 \\ 0 & 0 & 0 & 5 \end{matrix} = 3$$
$$\begin{matrix} (IV) + 15(II) \\ (IV) - \frac{1}{3}(III) \end{matrix} \quad \begin{matrix} 0 & 0 & 0 & 5 \\ 0 & 0 & 0 & 0 \end{matrix} = 0$$

$$A = \begin{pmatrix} 1 & 2 & 1 \\ 2 & 1 & 1 \\ 1 & 2 & 1 \end{pmatrix} \rightarrow |A| = 4 - 1 = 3$$

$$\begin{pmatrix} 2 & 1 & 1 & 0 \\ 1 & 2 & 0 & 1 \\ 1 & 2 & 1 & 0 \end{pmatrix} \xrightarrow{\text{Row } 1 \leftrightarrow \text{Row } 2} \begin{pmatrix} 1 & 2 & 0 & 1 \\ 2 & 1 & 1 & 0 \\ 1 & 2 & 1 & 0 \end{pmatrix} \xrightarrow{\text{Row } 2 - 2\text{Row } 1} \begin{pmatrix} 1 & 2 & 0 & 1 \\ 0 & -3 & 1 & -2 \\ 1 & 2 & 1 & 0 \end{pmatrix} \xrightarrow{\text{Row } 3 - \text{Row } 1}$$

$$\xrightarrow{\text{Row } 2 + 3\text{Row } 3} \begin{pmatrix} 1 & 2 & 0 & 1 \\ 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 \end{pmatrix} \xrightarrow{\text{Row } 1 - 2\text{Row } 2} \begin{pmatrix} 1 & 0 & \frac{2}{3} & -\frac{1}{3} \\ 0 & 1 & -\frac{1}{3} & \frac{2}{3} \end{pmatrix} \rightarrow A^{-1} = \frac{1}{3} \begin{pmatrix} 2 & -1 \\ -1 & 2 \end{pmatrix}$$

$$A \cdot A^{-1} = \begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix} \cdot \frac{1}{3} \begin{pmatrix} 2 & -1 \\ -1 & 2 \end{pmatrix} = \frac{1}{3} \begin{pmatrix} 4 & 0 \\ 0 & 4 \end{pmatrix} = \boxed{I_2}$$