

$$\underline{A} = \left(\begin{array}{cc|cc} 2 & 1 & 1 & 0 \\ 1 & 2 & 0 & 1 \end{array} \right) \rightarrow \left(\begin{array}{cc|cc} 2 & 1 & 1 & 0 \\ 0 & \frac{3}{2} & -\frac{1}{2} & 1 \end{array} \right) \rightarrow \left(\begin{array}{cc|cc} 1 & \frac{1}{2} & \frac{1}{2} & 0 \\ 0 & \frac{3}{2} & -\frac{1}{2} & 1 \end{array} \right) \rightarrow$$

$$|A| = 2^2 - 1^2 = 3 \neq 0 \quad (II) - \frac{1}{2}(I)$$

$$\rightarrow \left(\begin{array}{cc|cc} 1 & 0 & \frac{1}{2} + \frac{1}{2} & -\frac{1}{2} \\ 0 & \frac{3}{2} & -\frac{1}{2} & 1 \end{array} \right) = \left(\begin{array}{cc|cc} 1 & 0 & \frac{2}{3} & -\frac{1}{3} \\ 0 & \frac{3}{2} & -\frac{1}{2} & 1 \end{array} \right) \xrightarrow{\frac{2}{3}(I)} \left(\begin{array}{cc|cc} 1 & 0 & \frac{2}{3} & -\frac{1}{3} \\ 0 & 1 & -\frac{2}{6} & \frac{2}{3} \end{array} \right) =$$

$$(I) - \frac{1}{3}(II)$$

$$= \left(\begin{array}{cc|cc} 1 & 0 & \frac{2}{3} & -\frac{1}{3} \\ 0 & 1 & -\frac{1}{3} & \frac{2}{3} \end{array} \right) \rightarrow \underline{A}^{-1} = \frac{1}{3} \begin{pmatrix} 2 & -1 \\ -1 & 2 \end{pmatrix}$$



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

$$\underline{A} = \begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix} \rightarrow \begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix} \rightarrow \begin{pmatrix} 2 & -1 \\ -1 & 2 \end{pmatrix} \xrightarrow{\text{Transpose}} \begin{pmatrix} 2 & -1 \\ -1 & 2 \end{pmatrix} \rightarrow \underline{A}^{-1} = \frac{1}{3} \begin{pmatrix} 2 & -1 \\ -1 & 2 \end{pmatrix}$$

$$|\underline{A}| = 3 \neq 0$$

$$\underline{D} = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

$$|\underline{D}| = 0 + 0 + (-3) - 1 - 2 = -6$$

$$\begin{vmatrix} 1 & 2 \\ 1 & 0 \end{vmatrix} = -2 \quad \begin{vmatrix} 3 & 2 \\ -1 & 0 \end{vmatrix} = -2 \quad \begin{vmatrix} +3 & 1 \\ -1 & 1 \end{vmatrix} = +4 \quad \begin{pmatrix} -2 & 2 & 4 \\ +1 & -4 & 1 \\ +1 & 5 & 1 \end{pmatrix} \rightarrow$$

$$\begin{vmatrix} 0 & -1 \\ 1 & 0 \end{vmatrix} = +1 \quad \begin{vmatrix} 1 & -1 \\ -1 & 0 \end{vmatrix} = +1 \quad \begin{vmatrix} 1 & 0 \\ -1 & 1 \end{vmatrix} = -1$$

$$\begin{vmatrix} 0 & -1 \\ 1 & 2 \end{vmatrix} = +1 \quad \begin{vmatrix} 1 & -1 \\ 3 & 2 \end{vmatrix} = -5 \quad \begin{vmatrix} 1 & 0 \\ 3 & 1 \end{vmatrix} = -1$$

$$\rightarrow \begin{pmatrix} -2 & 2 & 4 \\ -1 & -1 & -1 \\ 1 & -5 & 1 \end{pmatrix} \rightarrow \underline{A}^{-1} = \frac{1}{6} \begin{pmatrix} +2 & +1 & -1 \\ +2 & +1 & -5 \\ -5 & +1 & 1 \end{pmatrix}$$