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Kelas : IF4A

1. Tentukan determinan dan invers matrix

$$A = \begin{bmatrix} 1 & 2 & 8 \\ 2 & 8 & 1 \\ 8 & 1 & 2 \end{bmatrix}$$

Determinan

$$\det A = \begin{bmatrix} 1 & 2 & 8 \\ 2 & 8 & 1 \\ 8 & 1 & 2 \end{bmatrix} \begin{matrix} 1 & 2 \\ 2 & 8 \\ 8 & 1 \end{matrix}$$

$$= (1 \times 8 \times 2) + (2 \times 1 \times 8) + (8 \times 2 \times 1) - (8 \times 8 \times 8) - (1 \times 1 \times 1) - (2 \times 2 \times 2)$$

$$= 16 + 16 + 16 - 512 - 1 - 8$$

$$= -473$$

$$\text{kof } A = \begin{bmatrix} +\begin{bmatrix} 8 & 1 \\ 1 & 2 \end{bmatrix} & -\begin{bmatrix} 2 & 1 \\ 8 & 2 \end{bmatrix} & +\begin{bmatrix} 2 & 8 \\ 8 & 1 \end{bmatrix} \\ -\begin{bmatrix} 2 & 8 \\ 1 & 2 \end{bmatrix} & +\begin{bmatrix} 1 & 8 \\ 8 & 2 \end{bmatrix} & -\begin{bmatrix} 1 & 2 \\ 8 & 1 \end{bmatrix} \\ +\begin{bmatrix} 2 & 8 \\ 8 & 1 \end{bmatrix} & -\begin{bmatrix} 1 & 8 \\ 2 & 1 \end{bmatrix} & +\begin{bmatrix} 1 & 2 \\ 2 & 8 \end{bmatrix} \end{bmatrix}$$

$$\text{matrix kof } A = \begin{bmatrix} 15 & 4 & -62 \\ 4 & -62 & 15 \\ -62 & 15 & 4 \end{bmatrix}$$

$$\text{matrix Adjoin } A = \begin{bmatrix} 15 & 4 & -62 \\ 4 & -62 & 15 \\ -62 & 15 & 4 \end{bmatrix}$$

$$A^{-1} = \frac{1}{\det A}(adj\,A)$$

$$A^{-1} = \frac{1}{-473} \begin{bmatrix} 15 & 4 & -62 \\ 4 & -62 & 15 \\ -62 & 15 & 4 \end{bmatrix}$$

$$A^{-1} = \begin{bmatrix} -\dfrac{1}{473} & -\dfrac{4}{473} & \dfrac{62}{473} \\ -\dfrac{4}{473} & \dfrac{62}{473} & -\dfrac{15}{473} \\ \dfrac{62}{473} & -\dfrac{15}{473} & -\dfrac{4}{473} \end{bmatrix}$$

2. Tentukan determinan dan invers matrix berikut menggunakan metode minor dan kofaktor

$$A = \begin{bmatrix} 1 & 4 & 6 & 1 \\ 1 & 0 & 0 & 1 \\ 3 & 2 & 4 & 5 \\ 5 & 8 & 4 & 2 \end{bmatrix}$$

$$\text{kof } A = \begin{bmatrix} -24 & 20 & -22 & 24 \\ -144 & 94 & -54 & 92 \\ 32 & -18 & 12 & -32 \\ 4 & -12 & 8 & -4 \end{bmatrix}$$

$$\text{adj } A = \begin{bmatrix} -24 & -144 & 32 & 4 \\ 20 & 94 & -18 & -12 \\ -22 & -54 & 12 & 8 \\ 24 & 92 & -32 & -4 \end{bmatrix}$$

$$\det A = \begin{vmatrix} 1 & 4 & 6 & 1 \\ 1 & 0 & 0 & 1 \\ 3 & 2 & 4 & 5 \\ 5 & 8 & 4 & 2 \end{vmatrix} = -92$$

$$A^{-1} = \frac{1}{\det A} \begin{bmatrix} -24 & -144 & 32 & 4 \\ 20 & 94 & -18 & -12 \\ -22 & -54 & 12 & 8 \\ 24 & 92 & -32 & -4 \end{bmatrix}$$

$$A^{-1} = \begin{bmatrix} \dfrac{24}{92} & \dfrac{144}{92} & -\dfrac{32}{92} & -\dfrac{4}{92} \\ -\dfrac{20}{92} & -\dfrac{94}{92} & \dfrac{18}{92} & \dfrac{12}{92} \\ \dfrac{22}{92} & \dfrac{54}{92} & -\dfrac{12}{92} & -\dfrac{8}{92} \\ -\dfrac{24}{92} & -\dfrac{92}{92} & \dfrac{32}{92} & \dfrac{4}{92} \end{bmatrix}$$