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S1 TI 17A

Diketahui matriks $A = \begin{bmatrix} 1 & 5 & 0 & -1 \\ 3 & 2 & -1 & 0 \\ 4 & 3 & 0 & -1 \\ 0 & 1 & 2 & 4 \end{bmatrix}$ tentukan :

1. Determinan dengan metode ekspansi kofaktor.

2. Determinan dengan metode operasi baris elementer

1. $\det(A) = 1\begin{vmatrix} 1 & 5 & -1 \\ 4 & 3 & -1 \\ 0 & 1 & 4 \end{vmatrix} - 2\begin{vmatrix} 1 & 5 & -1 \\ 3 & 2 & 0 \\ 4 & 3 & -1 \end{vmatrix}$

$\det(A) = 1\left(1\begin{vmatrix} 3 & -1 \\ 1 & 4 \end{vmatrix} - 4\begin{vmatrix} 5 & -1 \\ 1 & 4 \end{vmatrix}\right) - 2\left(-1\begin{vmatrix} 3 & 2 \\ 4 & 3 \end{vmatrix} - 1\begin{vmatrix} 1 & 5 \\ 3 & 2 \end{vmatrix}\right)$

det(A) = 1(1[3.4-(-1).1]-4[5.4-(-1).1]-2((-1)[3.3-2.4]-1[1.2-5.3])

det(A) = 1(13-84)-2((-1)+13)

det(A) = (-71) – 24

det(A) = -95

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

$R_2 = R_2 - 3R_1$

$R_3 = R_3 - 4R_1$

$A = \begin{bmatrix} 1 & 5 & 0 & -1 \\ 0 & -13 & -1 & 3 \\ 0 & -17 & 0 & 3 \\ 0 & 1 & 2 & 4 \end{bmatrix}$

$R_3 = R_3 - {}^{17}/_{13}R_2$

$R_4 = R_4 - {}^{1}/_{13}R_2$

$A = \begin{bmatrix} 1 & 5 & 0 & -1 \\ 0 & -13 & -1 & 3 \\ 0 & 0 & {}^{17}/_{13} & -{}^{12}/_{13} \\ 0 & 0 & {}^{25}/_{13} & {}^{55}/_{13} \end{bmatrix}$

$R_4 = R_4 - {}^{25}/_{17}R_3$

$A = \begin{bmatrix} 1 & 5 & 0 & -1 \\ 0 & -13 & -1 & 3 \\ 0 & 0 & {}^{17}/_{13} & -{}^{12}/_{13} \\ 0 & 0 & 0 & {}^{95}/_{17} \end{bmatrix}$

$\det(A) = (1)(-13)\left({}^{17}/_{13}\right)\left({}^{95}/_{17}\right)$

$\det(A) = (-17)\left({}^{95}/_{17}\right) = -95$