2021 02 22

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Kelas = TI 3
Matkul = Aljabar Vector dan Matrixs

1) $X_1 + 2X_3 = 6$ (1)
$-3X_1 + 4X_2 + 6X_3 = 30$ (2)
$-X_1 - 2X_2 + 3X_3 = 8$ (3)

Jawab

$$A = \begin{vmatrix} 1 & 0 & 2 & 1 & 0 \\ -3 & 4 & 6 & -3 & 4 \\ -1 & -2 & 3 & -1 & -2 \end{vmatrix} = 44$$

$$A_1 = \begin{vmatrix} 6 & 0 & 2 & 6 & 0 \\ 30 & 4 & 6 & 30 & 4 \\ 8 & -2 & 3 & 8 & -2 \end{vmatrix} = -48 \quad \rightarrow X_1 = \frac{\det(A_1)}{\det(A)} = \frac{-48}{44}$$

$$A_2 = \begin{vmatrix} 1 & 6 & 2 & 1 & 6 \\ -3 & 30 & 6 & -3 & 30 \\ -1 & 8 & 3 & -1 & 8 \end{vmatrix} = 96 \quad \rightarrow X_2 = \frac{\det(A_2)}{\det(A)} = \frac{96}{44}$$

$$A_3 = \begin{vmatrix} 1 & 0 & 6 & 1 & 0 \\ -3 & 4 & 30 & -3 & 4 \\ -1 & -2 & 8 & -1 & -2 \end{vmatrix} = 104 \quad \rightarrow X_3 = \frac{\det(A_3)}{\det(A)} = \frac{104}{44}$$

2) $7X_1 - 2X_2 = 3$ (1)
$3X_1 + X_2 = 5$ (2)

Jawab:

$$A = \begin{vmatrix} 7 & -2 \\ 3 & 1 \end{vmatrix} \quad A = 7 - (-6) = 13$$

$$A_1 = \begin{vmatrix} 3 & -2 \\ 5 & 1 \end{vmatrix} \quad A_1 = 13 \rightarrow X_1 = \frac{13}{13} = 1$$

$$A_2 = \begin{vmatrix} 7 & 3 \\ 3 & 5 \end{vmatrix} \quad A_2 = 6 \rightarrow X_2 = \frac{6}{13}$$

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3) $4x + 5y = 2$ (1)
$11x + y + 2z = 3$ (2)
$x + 5y + 2z = 1$
Jawab:

$$A = \begin{vmatrix} 4 & 5 & 0 \\ 11 & 1 & 2 \\ 1 & 5 & 2 \end{vmatrix} \begin{matrix} 4 & 5 \\ 11 & 1 \\ 1 & 5 \end{matrix} \rightarrow -1324$$

$$A_1 = \begin{vmatrix} 2 & 5 & 0 \\ 3 & 1 & 2 \\ 1 & 5 & 2 \end{vmatrix} \begin{matrix} 2 & 5 \\ 3 & 1 \\ 1 & 5 \end{matrix} \Rightarrow -36 \rightarrow x = \frac{-36}{-132}$$

$$A_2 = \begin{vmatrix} 4 & 2 & 0 \\ 11 & 3 & 2 \\ 1 & 1 & 2 \end{vmatrix} \begin{matrix} 4 & 2 \\ 11 & 3 \\ 1 & 1 \end{matrix} \Rightarrow -68 \rightarrow y = \frac{-68}{-132}$$

$$A_3 = \begin{vmatrix} 4 & 5 & 2 \\ 11 & 1 & 3 \\ 1 & 5 & 1 \end{vmatrix} \begin{matrix} 4 & 5 \\ 11 & 1 \\ 1 & 5 \end{matrix} \Rightarrow 12 \rightarrow z = \frac{12}{-132}$$

4) $x - 4y + z = 6$
$4x - y + 2z = -1$
$2x + 2y - 3z = -20$
Jawab:

$$A = \begin{vmatrix} 1 & -4 & 1 \\ 4 & -1 & 2 \\ 2 & 2 & -3 \end{vmatrix} \begin{matrix} 1 & -4 \\ 4 & -1 \\ 2 & 2 \end{matrix} \Rightarrow -51$$

$$A_1 = \begin{vmatrix} 6 & -4 & 1 \\ -1 & -1 & 2 \\ -20 & 2 & 3 \end{vmatrix} \begin{matrix} 6 & -4 \\ -1 & -1 \\ -20 & 2 \end{matrix} \rightarrow 122 \Rightarrow x = \frac{122}{-51}$$

$$A_2 \begin{vmatrix} 1 & 6 & 2 \\ 4 & -1 & 2 \\ 2 & -20 & 3 \end{vmatrix} \begin{matrix} 1 & 6 \\ 4 & -1 \\ 2 & 20 \end{matrix} \rightarrow -153 \Rightarrow y = \frac{-153}{-51}$$

$$A3 = \begin{vmatrix} 1 & -4 & 6 \\ 4 & -1 & -1 \\ 2 & 2 & -20 \end{vmatrix} \begin{matrix} 1 & -4 \\ 4 & -1 \\ 2 & 2 \end{matrix} \rightarrow -228 \Rightarrow Z = \frac{-228}{-51}$$

5) $X_1 - 3X_2 + X_3 = 4 \ (1)$
$2X_1 - X_2 = -2 \ (2)$
$4X_1 - 3X_3 = 0 \ (3)$

Jawab

$$A \begin{vmatrix} 1 & -3 & 1 \\ 2 & -1 & 0 \\ 4 & 0 & 3 \end{vmatrix} \begin{matrix} 1 & -3 \\ 2 & -1 \\ 4 & 0 \end{matrix} \rightarrow -11$$

$$A1 \begin{vmatrix} 4 & -3 & 1 \\ -2 & -1 & 0 \\ 0 & 4 & 1 \end{vmatrix} \begin{matrix} 4 & -3 \\ -2 & -1 \\ 0 & 4 \end{matrix} \rightarrow 30 \rightarrow X_1 = \frac{30}{-11}$$

$$A2 \begin{vmatrix} 1 & 4 & 1 \\ 2 & -2 & 0 \\ 4 & 0 & -3 \end{vmatrix} \begin{matrix} 1 & 4 \\ 2 & -2 \\ 4 & 0 \end{matrix} \Rightarrow 26 \rightarrow X_2 = \frac{26}{-11}$$

$$A3 = \begin{vmatrix} 1 & -3 & 4 \\ 2 & -1 & -2 \\ 4 & 0 & 0 \end{vmatrix} \begin{matrix} 1 & -3 \\ 2 & -1 \\ 4 & 0 \end{matrix} \Rightarrow 40 \rightarrow X_3 = \frac{40}{-11}$$