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SOAL :

$$x_1 + x_2 + x_3 = 6$$

$$x_1 + 2x_2 - x_3 = 2$$

$$2x_1 + x_2 + 2x_3 = 10$$

JAWABAN :

1. Gauss Naif

$$\begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & -1 \\ 2 & 1 & 2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 6 \\ 2 \\ 10 \end{bmatrix}$$

Langkah:

$$\bullet \quad \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & -1 \\ 2 & 1 & 2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 6 \\ 2 \\ 10 \end{bmatrix}$$

$$\bullet \quad b_2 - 1b_1 \begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & -2 \\ 2 & 1 & 2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 6 \\ -4 \\ 10 \end{bmatrix}$$

$$\bullet \quad b_3 - 2b_1 \begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & -2 \\ 0 & -1 & 0 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 6 \\ -4 \\ -2 \end{bmatrix}$$

$$\bullet \quad b_3 - (-1)b_2 \begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & -2 \\ 0 & 0 & -2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 6 \\ -4 \\ -6 \end{bmatrix}$$

Hasil :

$$\triangleright -2 \cdot x_3 = -6$$

$$x_3 = \frac{-6}{-2}$$

$$x_3 = 3$$

$$\triangleright -2 \cdot x_2 = -4$$

$$x_2 = \frac{-4}{-2}$$

$$x_2 = 2$$

$$\triangleright x_1 + x_2 + x_3 = 6$$

$$x_1 + 2 + 3 = 6$$

$$x_1 + 5 = 6$$

$$x_1 = 1$$

2. Gauss Jordan

$$\begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & -1 \\ 2 & 1 & 2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 6 \\ 2 \\ 10 \end{bmatrix}$$

Langkah:

$$\bullet \left[\begin{array}{ccc|ccc} 1 & 1 & 1 & 1 & 0 & 0 \\ 1 & 2 & -1 & 0 & 1 & 0 \\ 2 & 1 & 2 & 0 & 0 & 1 \end{array} \right] \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 6 \\ 2 \\ 10 \end{bmatrix}$$

$$\bullet \begin{array}{ccc|ccc} b_2 - b_1 & 1 & 1 & 1 & 0 & 0 \\ b_3 - 2b_1 & 0 & 1 & -2 & 1 & 0 \end{array} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 6 \\ -4 \\ -2 \end{bmatrix}$$

$$\bullet \begin{array}{ccc|ccc} b_1 - b_2 & 1 & 0 & 2 & 0 & 0 \\ b_3 - (-1)b_2 & 0 & 1 & -2 & 0 & 1 \end{array} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 10 \\ -4 \\ -6 \end{bmatrix}$$

$$\bullet \quad b_3 / -2 \left[\begin{array}{ccc|ccc} 1 & 0 & 3 & 2 & 0 & 0 \\ 0 & 1 & -2 & -1 & 0 & 0 \\ 0 & 0 & 1 & 3/2 & 0 & 1/-2 \end{array} \right] \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 10 \\ -4 \\ 3 \end{bmatrix}$$

$$\bullet \quad \begin{array}{l} b_1 - 3b_3 \\ b_2 - (-2)b_3 \end{array} \left[\begin{array}{ccc|ccc} 1 & 0 & 0 & -5/2 & 0 & 3/2 \\ 0 & 1 & 0 & 2 & 0 & -1 \\ 0 & 0 & 1 & 3/2 & 0 & 1/-2 \end{array} \right] \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$$

Jadi: $x_1 = 1, x_2 = 2, x_3 = 3$

