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1.) Tentukan solusi dari sistem persamaan linear berikut dengan menggunakan aturan Cramer!

$$x_1 + x_2 + x_3 = 2$$

$$x_1 + 2x_2 + 4x_3 = -2$$

$$x_1 + 3x_2 + 9x_3 = 2$$

$$\Rightarrow A = \begin{vmatrix} 1 & 1 & 1 \\ 1 & 2 & 4 \\ 1 & 3 & 9 \end{vmatrix} \quad B = \begin{vmatrix} 2 \\ -2 \\ 2 \end{vmatrix}$$

$$\det A = \begin{vmatrix} 1 & 1 & 1 \\ 1 & 2 & 4 \\ 1 & 3 & 9 \end{vmatrix}$$

$$= (18 + 4 + 3) - (2 + 12 + 9)$$

$$= 25 - 23$$

$$= 2$$

$$\det A_1 = \begin{vmatrix} 2 & 1 & 1 \\ -2 & 2 & 4 \\ 2 & 3 & 9 \end{vmatrix}$$

$$= (36 + 8 + (-6)) - (4 + 24 + (-18))$$

$$= 38 - 10$$

$$= 28$$

$$x = \frac{\det A_1}{\det A} = \frac{28}{2} = 14$$

No.:

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$$\det A_2 = \begin{vmatrix} 1 & 2 & 1 & 1 & 2 \\ 1 & 2 & 4 & 1 & -2 \\ 1 & 2 & 9 & 1 & 2 \end{vmatrix}$$

$$= [(-18) + 8 + 2] - [(-2) + 8 + 18]$$

$$= -8 - 24$$

$$= -32$$

$$y = \frac{\det A_2}{\det A} = \frac{-32}{2} = -16.$$

$$\det A_3 = \begin{vmatrix} 1 & 1 & 2 & 1 & 1 \\ 1 & 2 & -2 & 1 & 2 \\ 1 & 3 & 2 & 1 & 3 \end{vmatrix}$$

$$= (4 + (-2) + 6) - (4 + (-6) + 2)$$

$$= 8 - 0$$

$$= 8$$

$$z = \frac{\det A_3}{\det A} = \frac{8}{2} = 4.$$

Jadi, SPL dari persamaan tersebut adalah. $x = 14$, $y = -16$, $z = 4$

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

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

No.:

Date.:

$$= \left[\begin{array}{ccc|ccc} 1 & 2 & 2 & 1/2 & 0 & 0 \\ 1 & 5 & 2 & 0 & 1 & 0 \\ -1 & -2 & -3 & 0 & 0 & 1 \end{array} \right] \Rightarrow \left[\begin{array}{ccc|ccc} 1 & 2 & 2 & 1/2 & 0 & 0 \\ 1 & 5 & 2 & 0 & 1 & 0 \\ 1 & 2 & 3 & 0 & 0 & -1 \end{array} \right]$$

$$= \left[\begin{array}{ccc|ccc} 1 & 2 & 2 & 1/2 & 0 & 0 \\ 0 & 3 & 0 & -1/2 & 1 & 0 \\ 1 & 2 & 3 & 0 & 0 & 1 \end{array} \right] \Rightarrow \left[\begin{array}{ccc|ccc} 1 & 2 & 2 & 1/2 & 0 & 0 \\ 0 & 3 & 0 & -1/2 & 1 & 0 \\ 0 & 0 & 1 & -1/2 & 0 & -1 \end{array} \right]$$

$$= \left[\begin{array}{ccc|ccc} 1 & 2 & 2 & 1/2 & 0 & 0 \\ 0 & 1 & 0 & -1/6 & 1/3 & 0 \\ 0 & 0 & 1 & -1/2 & 0 & -1 \end{array} \right] \Rightarrow \left[\begin{array}{ccc|ccc} 5/6 & -2/3 & 0 \\ -1/6 & 1/3 & 0 \\ 1/2 & 0 & -1 \end{array} \right]$$

$$= \left[\begin{array}{ccc|ccc} 1 & 0 & 0 & 11/6 & -2/3 & 2 \\ 0 & 1 & 0 & -1/6 & 1/3 & 0 \\ 0 & 0 & 1 & -1/2 & 0 & -1 \end{array} \right] \Rightarrow \left[\begin{array}{ccc|ccc} 1 & 0 & 0 & 11/6 & -2/3 & 6 \\ 0 & 1 & 0 & -1/6 & 1/3 & 0 \\ 1 & 0 & 1 & -1/2 & 0 & -1 \end{array} \right]$$

$$= \left[\begin{array}{ccc|ccc} 11/6 & -2/3 & 2 \\ -1/6 & 1/3 & 0 \\ 1/2 & 0 & -1 \end{array} \right]$$