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[TUGAS 5]

$$9x_1 - 2x_2 + 8x_3 = 11$$
$$3x_1 + 5x_2 - x_3 = 4$$
$$-5x_1 + 2x_2 + 4x_3 = -7$$

$$\Rightarrow \begin{bmatrix} 9 & -2 & 8 \\ 3 & 5 & -1 \\ -5 & 2 & 4 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 11 \\ 4 \\ 7 \end{bmatrix}$$

$|A|$ $|x|$ $|B|$

OBE

$$\begin{bmatrix} 1 & 0 & 0 \\ & 1 & 0 \\ & & 1 \end{bmatrix} \begin{bmatrix} 9 & -2 & 8 \\ 3 & 5 & -1 \\ -5 & 2 & 4 \end{bmatrix} \rightarrow -1/3\, b_1 + b_2 \begin{bmatrix} 1 & 0 & 0 \\ 1/3 & 1 & 0 \\ & & 1 \end{bmatrix} \begin{bmatrix} 9 & -2 & 8 \\ 0 & 17/3 & -11/3 \\ -5 & 2 & 4 \end{bmatrix}$$

$$\rightarrow 5/9\, b_1 + b_3 \begin{bmatrix} 1 & 0 & 0 \\ 1/3 & 1 & 0 \\ -5/9 & & 1 \end{bmatrix} \begin{bmatrix} 9 & -2 & 8 \\ 0 & 17/3 & -11/3 \\ 0 & 8/9 & 76/9 \end{bmatrix}$$

$$\rightarrow -8/51\, b_2 + b_3 \begin{bmatrix} 1 & 0 & 0 \\ 1/3 & 1 & 0 \\ -5/9 & 8/51 & 1 \end{bmatrix} \begin{bmatrix} 9 & -2 & 8 \\ 0 & 17/3 & -11/3 \\ 0 & 0 & 460/51 \end{bmatrix}$$

$|L|$ $|U|$

$|L||U||x| = |B|$

$$\begin{bmatrix} 1 & 0 & 0 \\ 1/3 & 1 & 0 \\ -5/9 & 8/51 & 1 \end{bmatrix} \begin{bmatrix} 9 & -2 & 8 \\ 0 & 17/3 & -11/3 \\ 0 & 0 & 460/51 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 11 \\ 4 \\ -7 \end{bmatrix}$$

$|L||Y| = |B|$

$$\begin{bmatrix} 1 & 0 & 0 \\ 1/3 & 1 & 0 \\ -5/9 & 8/51 & 1 \end{bmatrix} \begin{bmatrix} Y_1 \\ Y_2 \\ -1/3 \end{bmatrix} = \begin{bmatrix} 11 \\ 4 \\ -7 \end{bmatrix}$$

$\boxed{Y_1 = 11}$

$1/3\, Y_1 + Y_2 = 4$

$\boxed{Y_2 = 4 - 11/3 = 1/3}$

$-5/9\, Y_1 + 8/51\, Y_2 + Y_3 = -7$

$Y_2 = -7 + 55/9 - 8/153$

$\boxed{Y_3 = -16/17}$

$|U||x| = |Y|$

$$\begin{bmatrix} 9 & -2 & 8 \\ 0 & 17/3 & -11/3 \\ 0 & 0 & 460/51 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 11 \\ 1/3 \\ -16/17 \end{bmatrix}$$

$460/51\, x_3 = -16/17$

$\boxed{x_3 = -12/115}$

$17/3\, x_2 - 11/3\, x_3 = 1/3$

$17/3\, x_2 = 1/3 - 44/115$

$\boxed{x_2 = -1/115}$

$9x_1 - 2x_2 + 8x_3 = 11$

$9x_1 = 11 - 2/115 + 96/115$

$\boxed{x_1 = 151/115}$

Jadi, ditemukan :
$x_1 = 1,31304$
$x_2 = -0,00869$
$x_3 = -0,10434$