

Пример 4

2.3

$$\begin{cases} x + y - z = 1 \\ 2x - y + 4z = 1 \\ -x + 6y + z = 5 \end{cases}, A = \begin{pmatrix} 1 & 1 & -1 \\ 2 & -1 & 4 \\ -1 & 6 & 1 \end{pmatrix}, B = \begin{pmatrix} 1 \\ 1 \\ 5 \end{pmatrix}$$

$$x_1 = \frac{\Delta_1}{\Delta} \quad \Delta = (-1 - 12 - 4 + 1 - 2 - 34) = -42$$

$$\Delta_1 = \begin{pmatrix} 1 & -1 \\ 2 & 4 \\ -1 & 1 \end{pmatrix} = -1 - 5 + 10 - 5 - 1 - 48 = -42$$

$$\Delta_2 = \begin{pmatrix} 1 & 2 & -1 \\ 2 & 1 & 4 \\ -1 & 5 & 1 \end{pmatrix} = 1 - 10 - 8 - 1 - 4 - 10 = -42$$

$$\Delta_3 = \begin{pmatrix} 1 & 1 & 2 \\ 2 & -1 & 1 \\ -1 & 6 & 5 \end{pmatrix} = -5 + 24 - 1 - 2 - 10 - 6 = 0$$

$$x = \frac{42}{42} = 1$$

$$y = -\frac{42}{42} = -1$$

$$z = \frac{0}{42} = 0$$

Answer

$$\textcircled{3.1} \begin{cases} 5x_1 + 10x_2 = 3 \\ 3x_1 + 6x_2 = 1 \end{cases}, A = \begin{pmatrix} 5 & 10 \\ 3 & 6 \end{pmatrix}, B = \begin{pmatrix} 3 \\ 1 \end{pmatrix}$$

$$M_1 = 5 \Rightarrow r = 1$$

$$M_2 = \begin{vmatrix} 5 & 10 \\ 3 & 6 \end{vmatrix} = 0 \Rightarrow r = 1$$

$$(A|B) = \left(\begin{array}{cc|c} 5 & 10 & 3 \\ 3 & 6 & 1 \end{array} \right)$$

$$M_1 = 10 \Rightarrow r = 1$$

$$M_2 = \begin{vmatrix} 10 & 3 \\ 6 & 1 \end{vmatrix} = -8 \Rightarrow r = 2$$

$$r = 2$$

$$r(A) \neq r(B) \Rightarrow \text{нет решений}$$

Система несовместна // ответ