„Домашняя работа
„Обратная матрица"

1.4.37.

$$A=\begin{pmatrix}-1 & 0 & 0\\ 0 & 0 & 2\\ 0 & 0{,}5 & 0\end{pmatrix}$$

1) $\det A=\begin{vmatrix}-1 & 0 & 0\\ 0 & 0 & 2\\ 0 & 0{,}5 & 0\end{vmatrix}=(-1)\cdot 0\cdot 0+0\cdot 0{,}5\cdot 0+0\cdot 2\cdot 0-0\cdot 0\cdot 0-0{,}5\cdot 2\cdot(-1)-0\cdot 0\cdot 2=1\neq 0\Rightarrow\exists A^{-1}$

2) $A_{11}=(-1)\cdot\begin{vmatrix}0 & 2\\ 0{,}5 & 0\end{vmatrix}=-1$

$A_{22}=(-1)\cdot\begin{vmatrix}0 & 2\\ 0 & 0\end{vmatrix}=0$

$A_{13}=(-1)\cdot\begin{vmatrix}0 & 0\\ 0 & 0{,}5\end{vmatrix}=0$

$A_{21}=(-1)\cdot\begin{vmatrix}0 & 0\\ 0{,}5 & 0\end{vmatrix}=0$

$A_{22}=(-1)\cdot\begin{vmatrix}-1 & 0\\ 0 & 0\end{vmatrix}=0$

$A_{23}=(-1)\cdot\begin{vmatrix}-1 & 0\\ 0 & 0{,}5\end{vmatrix}=0{,}5$

$A_{31}=(-1)\cdot\begin{vmatrix}0 & 0\\ 0 & 2\end{vmatrix}=0$

$A_{32}=(-1)\cdot\begin{pmatrix}-1 & 0\\ 0 & 2\end{pmatrix}=2$

$A_{33}=(-1)\cdot\begin{pmatrix}-1 & 0\\ 0 & 0\end{pmatrix}=0$

3) $A = \begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & 0,5 \\ 0 & 2 & 0 \end{pmatrix}^T = \begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & 2 \\ 0 & 0,5 & 0 \end{pmatrix}$

4) $A^{-1} = \frac{1}{\det A} \cdot \tilde{A} = \frac{1}{1} \cdot \begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & 2 \\ 0 & 0,5 & 0 \end{pmatrix} = \begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & 2 \\ 0 & 0,5 & 0 \end{pmatrix}$

1.4.38

$A = \begin{pmatrix} 1 & 1 & -1 \\ 8 & 3 & -6 \\ -4 & -1 & 3 \end{pmatrix}$

1) $\det A = \begin{vmatrix} 1 & 1 & -1 \\ 8 & 3 & -6 \\ -4 & -1 & 3 \end{vmatrix} = -1 \neq 0 \Rightarrow \exists A^{-1}$

2) $A_{11} = (-1) \cdot \begin{vmatrix} 3 & -6 \\ -1 & 3 \end{vmatrix} = 3$

$A_{12} = (-1) \begin{vmatrix} 8 & -6 \\ -4 & 3 \end{vmatrix} = 0$

$A_{13} = (-1) \cdot \begin{vmatrix} 8 & 3 \\ -4 & -1 \end{vmatrix} = 4$

$A_{21} = -1 \cdot \begin{pmatrix} 1 & -1 \\ -1 & 3 \end{pmatrix} = -2$

$A_{22} = -1 \cdot \begin{vmatrix} 1 & -1 \\ -4 & 3 \end{vmatrix} = -1$

$A_{23} = -1 \cdot \begin{vmatrix} 1 & 1 \\ -4 & -1 \end{vmatrix} = -3$

$A_{31} = -1 \cdot \begin{vmatrix} 1 & -1 \\ 3 & -6 \end{vmatrix} = 3$

$$A_{32} = -1 \cdot \begin{vmatrix} 1 & -1 \\ 8 & -6 \end{vmatrix} = -2$$

$$A_{33} = -1 \cdot \begin{vmatrix} 1 & 1 \\ 8 & 3 \end{vmatrix} = -5$$

3) $$\tilde{A} = \begin{pmatrix} 3 & 0 & 4 \\ -2 & -1 & -3 \\ 3 & -2 & -5 \end{pmatrix}^T = \begin{pmatrix} 3 & -2 & 3 \\ 0 & -1 & -2 \\ 4 & -3 & -5 \end{pmatrix}$$

4) $$A^{-1} = \frac{1}{-1} \cdot \begin{pmatrix} 3 & -2 & 3 \\ 0 & -1 & -2 \\ 4 & -3 & -5 \end{pmatrix} = \begin{pmatrix} -3 & 2 & -3 \\ 0 & 1 & 2 \\ -4 & 3 & 5 \end{pmatrix}$$

1.4.39

$$A = \begin{pmatrix} 1 & 1 & 2 \\ 2 & -1 & 2 \\ 4 & 1 & 4 \end{pmatrix}$$

1) $$\det A = \begin{vmatrix} 1 & 1 & 2 \\ 2 & -1 & 2 \\ 4 & 1 & 4 \end{vmatrix} = 6 \neq 0 \Rightarrow \exists A^{-1}$$

2) $$A_{11} = 1 \cdot \begin{vmatrix} -1 & 2 \\ 1 & 4 \end{vmatrix} = -6$$

$$A_{12} = -1 \cdot \begin{vmatrix} 2 & 2 \\ 4 & 4 \end{vmatrix} = 0$$

$$A_{13} = 1 \cdot \begin{vmatrix} 2 & -1 \\ 4 & 1 \end{vmatrix} = 6$$

$$A_{21} = -1 \cdot \begin{vmatrix} 1 & 2 \\ 1 & 4 \end{vmatrix} = -2$$

$$A_{22} = 1 \cdot \begin{vmatrix} 1 & 2 \\ 4 & 4 \end{vmatrix} = -4$$

$A_{23} = -1 \cdot \begin{vmatrix} 1 & 1 \\ 4 & 1 \end{vmatrix} = 3$

$A_{31} = 1 \cdot \begin{vmatrix} 1 & 2 \\ -1 & 2 \end{vmatrix} = 4$

$A_{32} = -1 \cdot \begin{vmatrix} 1 & 2 \\ 2 & 2 \end{vmatrix} = 2$

$A_{33} = 1 \cdot \begin{vmatrix} 1 & 1 \\ 2 & -1 \end{vmatrix} = -3$

3) $\tilde{A} = \begin{pmatrix} -6 & 0 & 6 \\ -2 & -4 & 3 \\ 4 & 2 & -3 \end{pmatrix}^T = \begin{pmatrix} -6 & -2 & 4 \\ 0 & -4 & 2 \\ 6 & 3 & -3 \end{pmatrix}$

4) $A^{-1} = \frac{1}{6} \cdot \begin{pmatrix} -6 & -2 & 4 \\ 0 & -4 & 2 \\ 6 & 3 & -3 \end{pmatrix} = \begin{pmatrix} -1 & -\frac{1}{3} & \frac{2}{3} \\ 0 & -\frac{2}{3} & \frac{1}{3} \\ 1 & \frac{1}{2} & -\frac{1}{2} \end{pmatrix}$

1.440

$A = \begin{pmatrix} 3 & 4 & 2 \\ 2 & -4 & -3 \\ 1 & 5 & 1 \end{pmatrix}$

1) $\det A = \begin{vmatrix} 3 & 4 & 2 \\ 2 & -4 & -3 \\ 1 & 5 & 1 \end{vmatrix} = 41 \neq 0 \Rightarrow \exists A^{-1}$

2) $A_{11} = 1 \cdot \begin{vmatrix} 4 & -3 \\ 5 & 1 \end{vmatrix} = 11$

$A_{12} = -1 \cdot \begin{vmatrix} 2 & -3 \\ 1 & 1 \end{vmatrix} = -5$

$A_{13} = 1 \cdot \begin{vmatrix} 2 & -4 \\ 1 & 5 \end{vmatrix} = 14$

$A_{21} = -1 \cdot \begin{vmatrix} 4 & 2 \\ 5 & 1 \end{vmatrix} = 6$

$A_{22} = 1 \begin{vmatrix} 3 & 2 \\ 1 & 1 \end{vmatrix} = 1$

$A_{23} = -1 \cdot \begin{vmatrix} 3 & 4 \\ 1 & 5 \end{vmatrix} = -11$

$A_{31} = 1 \cdot \begin{vmatrix} 4 & 2 \\ -4 & -3 \end{vmatrix} = -4$

$A_{32} = -1 \cdot \begin{vmatrix} 3 & 2 \\ 2 & -3 \end{vmatrix} = 13$

$A_{33} = 1 \cdot \begin{vmatrix} 3 & 4 \\ 2 & -4 \end{vmatrix} = -20$

3) $\tilde{A} = \begin{pmatrix} 11 & 6 & -4 \\ -5 & 1 & 13 \\ 14 & -11 & -20 \end{pmatrix}$

4) $A^{-1} = \frac{1}{41} \cdot \begin{pmatrix} 11 & 6 & -4 \\ -5 & 1 & 13 \\ 14 & -11 & -20 \end{pmatrix} = \begin{pmatrix} \frac{11}{41} & \frac{6}{41} & -\frac{4}{41} \\ -\frac{5}{41} & \frac{1}{41} & \frac{13}{41} \\ \frac{14}{41} & -\frac{11}{41} & -\frac{20}{41} \end{pmatrix}$

1.4.43

$A = \begin{pmatrix} 1 & -1 & -1 \\ -1 & 2 & 1 \\ -1 & 1 & 2 \end{pmatrix}$

1) $\det A = \begin{vmatrix} 1 & -1 & -1 \\ -1 & 2 & 1 \\ -1 & 1 & 2 \end{vmatrix} = 1 \neq 0 \Rightarrow \exists A^{-1}$

2) $T = \left(\begin{array}{ccc|ccc} 1 & -1 & -1 & 1 & 0 & 0 \\ -1 & 2 & 1 & 0 & 1 & 0 \\ -1 & 1 & 2 & 0 & 0 & 1 \end{array}\right) \begin{matrix} \\ II+I \\ III+I \end{matrix} \sim \begin{pmatrix} 1 & -1 & -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 1 & 1 & 0 & 1 \end{pmatrix} \begin{matrix} I+III \\ I+II \\ \sim \end{matrix}$

$$\sim \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & 3 & 1 & 1 \\ 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 1 & 1 & 0 & 1 \end{array}\right) = (E|A^{-1}) = \Gamma c$$

$$A^{-1} = \begin{pmatrix} 3 & 1 & 1 \\ 1 & 1 & 0 \\ 1 & 0 & 1 \end{pmatrix}$$

1.4.45

$$A = \begin{pmatrix} 1 & 2 & -2 & 4 \\ 2 & 6 & 1 & 0 \\ 3 & 0 & 1 & 2 \\ -1 & 4 & 5 & -4 \end{pmatrix} \Rightarrow \det A = -2 \cdot \begin{vmatrix} 2 & -2 & 4 \\ 0 & 1 & 2 \\ 4 & 5 & -4 \end{vmatrix} +$$

$$+ 6 \begin{vmatrix} 1 & -2 & 4 \\ 3 & 1 & 2 \\ -1 & 5 & -4 \end{vmatrix} - 1 \begin{vmatrix} 1 & 2 & 4 \\ 3 & 0 & 2 \\ -1 & 4 & -4 \end{vmatrix} = -2 \cdot (-60) + 6 \cdot 30 - 1 \cdot 60 =$$

$$= 240 \neq 0 \Rightarrow \boxed{\exists} A^{-1}$$

$$\Gamma(A|E) = \left(\begin{array}{cccc|cccc} 1 & 2 & -2 & 4 & 1 & 0 & 0 & 0 \\ 2 & 6 & 1 & 0 & 0 & 1 & 0 & 0 \\ 3 & 0 & 1 & 2 & 0 & 0 & 1 & 0 \\ -1 & 4 & 5 & -4 & 0 & 0 & 0 & 1 \end{array}\right) \begin{array}{l} II - 2I \\ III - 3I \\ IV + I \end{array} \sim$$

$$\sim \left(\begin{array}{cccc|cccc} 1 & 2 & -2 & 4 & 1 & 0 & 0 & 0 \\ 0 & 2 & 5 & -8 & -2 & 1 & 0 & 0 \\ 0 & -6 & 7 & -10 & -3 & 0 & 1 & 0 \\ 0 & 6 & 3 & 0 & 1 & 0 & 0 & 1 \end{array}\right) \begin{array}{l} II : 2 \\ III + 3II \\ IV - 3II \end{array} \sim$$

$$\sim \left(\begin{array}{cccc|cccc} 1 & 2 & -2 & 4 & 1 & 0 & 0 & 0 \\ 0 & 1 & 2{,}5 & -4 & -1 & 0{,}5 & 0 & 0 \\ 0 & 0 & -22 & -34 & -3 & 3 & 1 & 0 \\ 0 & 0 & -12 & 24 & 7 & -3 & 0 & 1 \end{array}\right) \begin{array}{l} I - 2II \\ \\ \\ 11 \cdot IV + 6III \end{array} \sim$$

$$\sim \left(\begin{array}{cccc|cccc} 1 & 0 & -7 & 12 & 3 & -1 & 0 & 0 \\ 0 & 1 & 2{,}5 & -4 & -1 & 0{,}5 & 0 & 0 \\ 0 & 0 & 22 & -34 & -9 & 3 & 1 & 0 \\ 0 & 0 & 0 & 60 & 23 & -15 & 6 & 11 \end{array}\right) \begin{array}{l} \\ \\ III : 22 \\ IV : 60 \end{array} \sim$$

$$\sim\left(\begin{array}{cccc|cccc} 1 & 0 & -7 & 12 & 3 & -1 & 0 & 0 \\ 0 & 1 & 2{,}5 & -4 & -1 & 0{,}5 & 0 & 0 \\ 0 & 0 & 1 & -\frac{17}{11} & -\frac{9}{22} & \frac{3}{22} & \frac{1}{22} & 0 \\ 0 & 0 & 0 & 1 & \frac{23}{60} & -\frac{15}{60} & \frac{1}{10} & \frac{11}{60} \end{array}\right) \begin{array}{l} I + 3\,III \\ II + 4\,IV \\ III + \frac{17}{11}\cdot IV \end{array} \sim$$

$$\sim\left(\begin{array}{cccc|cccc} 1 & 0 & 0 & 0 & -\frac{19}{60} & \frac{1}{4} & \frac{1}{5} & -\frac{13}{60} \\ 0 & 1 & 0 & 0 & \frac{8}{15} & -\frac{1}{2} & \frac{2}{2} & \frac{11}{15} \\ 0 & 0 & 1 & 0 & \frac{11}{60} & -\frac{1}{4} & \frac{1}{5} & \frac{17}{60} \\ 0 & 0 & 0 & 1 & \frac{23}{60} & -\frac{15}{60} & \frac{1}{10} & \frac{11}{60} \end{array}\right)$$

A^{-1}

1.4.50

$$x\cdot\begin{pmatrix}1 & 2\\ 3 & 4\end{pmatrix} = 0$$

$x\cdot A = B \Rightarrow x = B\cdot A^{-1}$

1) $\det A = -2 (\neq 0) \exists A^{-1}$

2) $A^{-1} = \frac{1}{\det A}\cdot\begin{pmatrix}a_{22} & -a_{11}\\ -a_{21} & a_{11}\end{pmatrix} = \frac{1}{-2}\begin{pmatrix}4 & -2\\ -3 & 1\end{pmatrix} =$

$= \begin{pmatrix}-2 & 1\\ \frac{3}{2} & -\frac{1}{2}\end{pmatrix}$

3) $x = B\cdot A^{-1} = \begin{pmatrix}0 & 0\\ 0 & 0\end{pmatrix}\cdot\begin{pmatrix}-2 & 1\\ 3 & -\frac{1}{2}\end{pmatrix} = \begin{pmatrix}0 & 0\\ 0 & 0\end{pmatrix}$

1.4.51

$$x\cdot\begin{pmatrix}4 & 3\\ -5 & -4\end{pmatrix} = \begin{pmatrix}1 & 0\\ 0 & 1\end{pmatrix}$$

1) $\det A = \begin{vmatrix} 4 & 3 \\ -5 & -4 \end{vmatrix} = -1 \neq 0 \Rightarrow \exists A^{-1}$

2) $A^{-1} = \frac{1}{-1} \cdot \begin{pmatrix} -4 & -3 \\ 5 & 4 \end{pmatrix} = \begin{pmatrix} 4 & 3 \\ -5 & -4 \end{pmatrix}$

3) $x = B \cdot A^{-1} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \cdot \begin{pmatrix} 4 & 3 \\ -5 & -4 \end{pmatrix} = \begin{pmatrix} 4 & 3 \\ -5 & -4 \end{pmatrix}$

1.4.52

$\begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix} \cdot x = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$

1) $\det A = \begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix} = 0 \Rightarrow \nexists A^{-1}$

Ответ: x - не существует.

1.4.53

$\begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix} \cdot x = \begin{pmatrix} 2 \\ 2 \end{pmatrix}$

1) $\det A = \begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix} = 0 \Rightarrow \nexists A^{-1}$

Ответ: не существ.

1.4.54

$\begin{pmatrix} 1 & -1 \\ 2 & 3 \end{pmatrix} \cdot x \cdot \begin{pmatrix} -5 & 6 \\ -4 & 5 \end{pmatrix} = \begin{pmatrix} 1 & -1 \\ 2 & 3 \end{pmatrix}$

$A \cdot x \cdot B = C \Rightarrow x = A^{-1} \cdot C \cdot B^{-1}$

1) $\det A = \begin{vmatrix} 1 & -1 \\ 2 & 3 \end{vmatrix} = 5 \neq 0 \Rightarrow \exists A^{-1}$

2) $\det C = \begin{vmatrix} -5 & 6 \\ -4 & 5 \end{vmatrix} = -1 \neq 0 \Rightarrow \exists C^{-1}$

3) $A^{-1} = \frac{1}{5} \cdot \begin{pmatrix} 3 & 1 \\ -2 & 1 \end{pmatrix} = \begin{pmatrix} 3/5 & 1/5 \\ -2/5 & 1/5 \end{pmatrix}$

4) $C^{-1} = \frac{1}{-1} \cdot \begin{pmatrix} 5 & -6 \\ 4 & -5 \end{pmatrix} = \begin{pmatrix} -5 & 6 \\ -4 & 5 \end{pmatrix}$

5) $x = \begin{pmatrix} \frac{3}{5} & \frac{1}{5} \\ -\frac{2}{5} & \frac{1}{5} \end{pmatrix} \cdot \begin{pmatrix} 1 & -1 \\ 2 & 3 \end{pmatrix} \cdot \begin{pmatrix} -5 & 6 \\ -4 & 5 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \cdot$

$\cdot \begin{pmatrix} -5 & 6 \\ -4 & 5 \end{pmatrix} = \begin{pmatrix} -5 & 6 \\ -4 & 5 \end{pmatrix}$

1.4.58

$\begin{pmatrix} 1 & -2 & 3 \\ 2 & 3 & -1 \\ 0 & -2 & 1 \end{pmatrix} \cdot x \cdot \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 0 \end{pmatrix} = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 0 \end{pmatrix}$

$A \cdot x \cdot C = B \Rightarrow x = A^{-1} \cdot B \cdot C^{-1}$

1) $\det A = \begin{vmatrix} 1 & -2 & 3 \\ 2 & 3 & -1 \\ 0 & -2 & 1 \end{vmatrix} = -7 \neq 0 \Rightarrow \exists A^{-1}$

2) $\det C = \begin{vmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 0 \end{vmatrix} = 27 \neq 0 \Rightarrow \exists C^{-1}$

3) $A_{11} = \begin{vmatrix} 3 & -1 \\ -2 & 1 \end{vmatrix} = 1$

$A_{12} = -\begin{vmatrix} 2 & -1 \\ 0 & 1 \end{vmatrix} = -2$

$A_{13} = \begin{vmatrix} 2 & 3 \\ 0 & -2 \end{vmatrix} = -4$

$A_{21} = -\begin{vmatrix} -2 & 3 \\ -2 & 1 \end{vmatrix} = -4$

$A_{22} = \begin{vmatrix} 1 & 3 \\ 0 & 1 \end{vmatrix} = 1$

$A_{23} = -\begin{vmatrix} 1 & -2 \\ 0 & -2 \end{vmatrix} = 2$

$A_{31} = \begin{vmatrix} -2 & 3 \\ 3 & -1 \end{vmatrix} = -7$

$A_{32} = -\begin{vmatrix} 1 & 3 \\ 2 & -1 \end{vmatrix} = 7$

$A_{3} = \begin{vmatrix} 1 & -2 \\ 2 & 3 \end{vmatrix} = 7$

$\tilde{A} = \begin{pmatrix} 1 & -4 & -7 \\ -2 & 1 & 7 \\ -4 & 2 & 7 \end{pmatrix}$

$A^{-1} = -\frac{1}{7} \cdot \begin{pmatrix} 1 & -4 & -7 \\ -2 & 1 & 7 \\ -4 & 2 & 7 \end{pmatrix} = \begin{pmatrix} -\frac{1}{7} & \frac{4}{7} & 1 \\ \frac{2}{7} & -\frac{1}{7} & -1 \\ \frac{4}{7} & -\frac{2}{7} & -1 \end{pmatrix}$

4) $A_{11} = \begin{vmatrix} 5 & 6 \\ 8 & 0 \end{vmatrix} = -48$

$A_{12} = -\begin{vmatrix} 4 & 6 \\ 7 & 0 \end{vmatrix} = 42$

$A_{13} = \begin{vmatrix} 4 & 5 \\ 7 & 8 \end{vmatrix} = -3$

$A_{21} = -\begin{vmatrix} 2 & 3 \\ 8 & 0 \end{vmatrix} = 24$

$A_{22} = \begin{vmatrix} 1 & 3 \\ 7 & 0 \end{vmatrix} = -21$

$A_{23} = -\begin{vmatrix} 1 & 2 \\ 7 & 8 \end{vmatrix} = 6$

$A_{31} = \begin{vmatrix} 2 & 3 \\ 5 & 6 \end{vmatrix} = -3$

$A_{32} = -\begin{vmatrix} 1 & 3 \\ 4 & 6 \end{vmatrix} = 6$

$A_{33} = \begin{vmatrix} 1 & 2 \\ 4 & 5 \end{vmatrix} = -3$

$$\tilde{C} = \begin{pmatrix} -48 & 24 & -3 \\ 42 & -21 & 6 \\ -3 & 6 & -3 \end{pmatrix}$$

$$C^{-1} = \frac{1}{27} \cdot \begin{pmatrix} -48 & 24 & -3 \\ 42 & -21 & 6 \\ -3 & 6 & -3 \end{pmatrix} = \begin{pmatrix} -16/9 & 8/9 & -1/9 \\ 14/9 & -7/9 & 2/9 \\ -1/9 & 2/9 & -1/9 \end{pmatrix}$$

3) $x = A^{-1} \cdot B \cdot C^{-1} =$

$$= \begin{pmatrix} -1/7 & 4/7 & 1 \\ 2/7 & -1/7 & -1 \\ 4/7 & -2/7 & -1 \end{pmatrix} \overset{1}{\cdot} \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 0 \end{pmatrix} \overset{2}{\cdot} \begin{pmatrix} -16/9 & 8/9 & -1/9 \\ 14/9 & -7/9 & 2/9 \\ -1/9 & 2/9 & -1/9 \end{pmatrix}$$

1) $\begin{pmatrix} -1/7 \cdot 1 + 4/7 \cdot 4 + 1 \cdot 7 & -1/7 \cdot 2 + 4/7 \cdot 5 + 1 \cdot 8 & -1/7 \cdot 3 + 4/7 \cdot 6 + 1 \cdot 0 \\ 2/7 \cdot 1 + (-1/7) \cdot 4 + (-1) 7 & 2/7 \cdot 2 + (-1/7) \cdot 5 + (-1) \cdot 8 & 2/7 \cdot 3 + (-1/7) \cdot 6 + (-1) \\ 4/7 \cdot 1 + (-2/7) \cdot 4 + (-1) \cdot 7 & 2 \cdot \frac{4}{7} + (-2/7) \cdot 5 + (-1) \cdot 8 & 4/7 \cdot 3 + (-2/7) \cdot 6 + (\end{pmatrix}$

1) $\begin{pmatrix} 64/7 & 74/7 & 3 \\ -51/7 & -57/7 & 0 \\ -53/7 & -58/7 & 0 \end{pmatrix}$

2) $\begin{pmatrix} 64/7 & 74/7 & 3 \\ -51/7 & -57/7 & 0 \\ -53/7 & -58/7 & 0 \end{pmatrix} \cdot \begin{pmatrix} -16/9 & 8/9 & -1/9 \\ 14/9 & -7/9 & 2/9 \\ -1/9 & 2/9 & -1/9 \end{pmatrix} =$

$$= \begin{pmatrix} \frac{64}{7}\cdot\left(-\frac{16}{9}\right)+\frac{74}{7}\cdot\frac{14}{9}+3\cdot\left(-\frac{1}{9}\right) & \frac{64}{7}\cdot\frac{8}{9}+\frac{74}{7}\cdot\left(-\frac{7}{9}\right)+3\cdot\frac{2}{9} & \frac{64}{7}\cdot\left(-\frac{1}{9}\right)+\frac{74}{7}\cdot\frac{2}{9}+3\cdot\left(-\frac{1}{9}\right) \\ -\frac{51}{7}\cdot\left(-\frac{16}{9}\right)+\left(-\frac{57}{7}\right)\cdot\frac{14}{9}+0\cdot\left(-\frac{1}{9}\right) & -\frac{51}{7}\cdot\frac{8}{9}+\left(-\frac{57}{7}\right)\cdot\left(-\frac{7}{9}\right)\cdot 0\cdot\frac{2}{9} & -\frac{51}{7}\cdot\left(-\frac{1}{9}\right)+\left(-\frac{57}{7}\right)\cdot\frac{2}{9}+0\cdot\left(-\frac{1}{9}\right) \\ -\frac{53}{7}\cdot\left(-\frac{16}{9}\right)+\left(-\frac{58}{7}\right)\cdot\frac{14}{9}+0\left(-\frac{1}{9}\right) & -\frac{53}{7}\cdot\frac{8}{9}+\left(-\frac{58}{7}\right)\cdot\left(-\frac{7}{9}\right)\cdot 0\,\frac{2}{9} & -\frac{53}{7}\cdot\left(-\frac{1}{9}\right)+\left(-\frac{58}{7}\right)\cdot\frac{2}{9}+0\cdot\left(-\frac{1}{9}\right) \end{pmatrix} = \begin{pmatrix} -\frac{1}{7} & \frac{4}{7} & 1 \\ \frac{2}{7} & -\frac{1}{7} & -1 \\ \frac{4}{7} & -\frac{2}{7} & -1 \end{pmatrix}$$

Домашняя работа „СЛАУ"

2.1.32

$$\begin{cases} x_1 - x_2 = 1 \\ 2x_1 - 2x_2 = 5 \end{cases}$$

$(A|B) = \left(\begin{array}{cc|c} 1 & -1 & 1 \\ 2 & -2 & 5 \end{array}\right) \text{II}-2\text{I} \sim \left(\begin{array}{cc|c} 1 & -1 & 1 \\ 0 & 0 & 3 \end{array}\right)$