Variant 1

1. Find the inverse matrix for the matrix $A=\begin{pmatrix} 2 & 8 & -3 \\ -1 & -7 & 4 \\ -3 & -6 & 2 \end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix} 2 & 3 & 3 \\ 1 & 0 & -2 \\ -1 & -4 & 1 \end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 2 and column 3.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} 2x_1+3x_2-2x_3=5 \\ -x_1+4x_2-x_3=3 \\ x_1-x_2+x_3=0 \end{cases}$; b) $\begin{cases} 3x_1+2x_2-4x_3=8 \\ 2x_1+4x_2-5x_3=11 \\ x_1-2x_2+x_3=1 \end{cases}$.

Variant 2

1. Find the inverse matrix for the matrix $A=\begin{pmatrix} 3 & 2 & -3 \\ 5 & 4 & 1 \\ -6 & 3 & 1 \end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix} 1 & 2 & 1 \\ 0 & -2 & -3 \\ -2 & -3 & 2 \end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 3 and column 2.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} x_1+4x_2-3x_3=5 \\ -2x_1+x_2-x_3=-1 \\ 3x_1-x_2+2x_3=2 \end{cases}$; **b)** $\begin{cases} x_1+x_2+x_3=1 \\ x_1-x_2+2x_3=-5 \\ 2x_1+3x_3=-2 \end{cases}$.

Variant 3

1. Find the inverse matrix for the matrix $A=\begin{pmatrix} 2 & 2 & 1 \\ 1 & -1 & 0 \\ -1 & 1 & 1 \end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix} 4 & 2 & 0 \\ 2 & 1 & -2 \\ -1 & -1 & 4 \end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 2 and column 1.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} 2x_1+2x_2-2x_3=-2 \\ -x_1+x_2-3x_3=-5 \\ x_1-x_2+x_3=3 \end{cases}$; b) $\begin{cases} 2x_1-x_2+4x_3=15 \\ 3x_1-x_2+x_3=8 \\ 5x_1-2x_2+5x_3=0 \end{cases}$.

Variant 4

1. Find the inverse matrix for the matrix $A=\begin{pmatrix} -6 & 9 & 0 \\ 1 & 2 & 3 \\ 11 & 5 & 7 \end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix} 1 & 4 & 1 \\ -3 & 0 & -1 \\ -2 & 1 & 3 \end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 1 and column 3.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} x_1+4x_2-2x_3=-5 \\ x_1+3x_2-2x_3=-4 \\ 3x_1+x_2-x_3=1 \end{cases}$; **b)** $\begin{cases} 3x_1-3x_2+2x_3=2 \\ 4x_1-5x_2+2x_3=1 \\ x_1-2x_2=5 \end{cases}$.

Variant 5

1. Find the inverse matrix for the matrix $A=\begin{pmatrix}3 & -1 & 1\\ 1 & 0 & 2\\ 2 & 2 & 1\end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix}0 & 2 & 4\\ 2 & 3 & -3\\ -1 & -3 & 5\end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 3 and column 2.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} x_1+4x_2-2x_3=2\\ x_1-3x_2+2x_3=-1;\\ 3x_1+x_2-x_3=0\end{cases}$ b) $\begin{cases} 3x_1+2x_2-4x_3=8\\ 2x_1+4x_2-5x_3=1.\\ 5x_1+6x_2-9x_3=2\end{cases}$

Variant 6

1. Find the inverse matrix for the matrix $A=\begin{pmatrix}2 & 1 & 4\\ 3 & 3 & 1\\ 2 & -1 & 3\end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix}4 & 0 & 2\\ 3 & 1 & -4\\ -5 & -1 & 5\end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 2 and column 1.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} x_1-2x_2-x_3=-3\\ x_1+2x_2-x_3=1\\ -3x_1-x_2-2x_3=-3\end{cases}$; b) $\begin{cases} 3x_1+x_2+2x_3=-3\\ 2x_1+2x_2+2x_3=5.\\ 5x_1+3x_2+7x_3=1\end{cases}$

Variant 7

1. Find the inverse matrix for the matrix $A=\begin{pmatrix} 6 & 3 & 2 \\ 7 & 1 & 2 \\ 3 & 0 & 1 \end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix} 2 & 3 & 3 \\ 3 & 2 & -4 \\ -4 & 0 & 2 \end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 3 and column 2.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} x_1 + 4x_2 - 3x_3 = -2 \\ -2x_1 + x_2 - x_3 = -3 \\ 3x_1 - x_2 + 2x_3 = 5 \end{cases}$; **b)** $\begin{cases} 4x_1 - 7x_2 - 2x_3 = 0 \\ 2x_1 - 3x_2 - 4x_3 = 6 \\ 2x_1 - 4x_2 + 2x_3 = 2 \end{cases}$.

Variant 8

1. Find the inverse matrix for the matrix $A=\begin{pmatrix} -2 & 3 & -1 \\ 3 & -1 & 2 \\ 4 & -4 & 2 \end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix} 5 & 6 & 1 \\ 4 & 0 & -1 \\ -3 & -1 & 4 \end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 1 and column 2.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} 4x_1 + x_2 - 3x_3 = 1 \\ x_1 - 4x_2 - x_3 = 0 \\ -2x_1 - x_2 + 4x_3 = 2 \end{cases}$; b) $\begin{cases} 5x_1 - 9x_2 - 4x_3 = 6 \\ x_1 - 7x_2 - 5x_3 = 1 \\ 4x_1 - 2x_2 + x_3 = 2 \end{cases}$.

Variant 9

1. Find the inverse matrix for the matrix $A=\begin{pmatrix} 1 & -4 & 0 \\ 7 & 9 & 3 \\ 3 & 4 & 2 \end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix} 5 & 1 & 2 \\ 7 & 2 & -3 \\ -1 & 0 & 6 \end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 2 and column 3.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} 2x_1 - 2x_2 - x_3 = 3 \\ x_1 + 3x_2 - x_3 = 2 \\ -3x_1 - 4x_2 - 2x_3 = -1 \end{cases}$; **b)** $\begin{cases} x_1 - 5x_2 + x_3 = 3 \\ 3x_1 + 2x_2 - x_3 = 7 \\ 4x_1 - 3x_2 = 1 \end{cases}$.

Variant 10

1. Find the inverse matrix for the matrix $A=\begin{pmatrix} 2 & 1 & 0 \\ 6 & 3 & 1 \\ 1 & 2 & 1 \end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix} 7 & 5 & 6 \\ 1 & 0 & -1 \\ -1 & -1 & 2 \end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 1 and column 2.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} 3x_1 - x_2 - x_3 = 4 \\ x_1 + 2x_2 + x_3 = 0 \\ -x_1 - 3x_2 - x_3 = -2 \end{cases}$; b) $\begin{cases} 5x_1 - 5x_2 - 4x_3 = -3 \\ x_1 - x_2 + 5x_3 = 1 \\ 4x_1 - 4x_2 - 9x_3 = 0 \end{cases}$.

Variant 11

1. Find the inverse matrix for the matrix $A=\begin{pmatrix} 6 & -1 & 10 \\ 9 & -1 & 1 \\ 4 & 1 & 7 \end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix} 5 & 1 & 0 \\ 3 & -3 & -1 \\ -2 & -2 & 4 \end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 2 and column 3.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} 2x_1 - 2x_2 - x_3 = -4 \\ x_1 + 2x_2 - 3x_3 = 1 \\ -3x_1 + x_2 - 2x_3 = -2 \end{cases}$ **;** **b)** $\begin{cases} 7x_1 - 2x_2 - x_3 = 2 \\ 6x_1 - 4x_2 - 5x_3 = 3 \\ x_1 + 2x_2 + 4x_3 = 5 \end{cases}$**.**

Variant 12

1. Find the inverse matrix for the matrix $A=\begin{pmatrix} 1 & 3 & 2 \\ 0 & 1 & 1 \\ 3 & 7 & 8 \end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix} 3 & 2 & 3 \\ 4 & -2 & -2 \\ -5 & -3 & 0 \end{pmatrix}$ on the base of Surrus formula
and check the result using the theorem concerning the decomposition of the determinant in row 3 and column 1.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

а) $\begin{cases} 3x_1 - x_2 + 2x_3 = -4 \\ x_1 + x_2 - x_3 = 0 \\ -3x_1 + x_2 - x_3 = 4 \end{cases}$; б) $\begin{cases} 4x_1 - 3x_2 + x_3 = 3 \\ x_1 + x_2 - x_3 = 4 \\ 3x_1 - 4x_2 + 2x_3 = 2 \end{cases}$.

Variant 13

1. Find the inverse matrix for the matrix $A=\begin{pmatrix} 5 & 1 & 8 \\ 1 & 3 & 4 \\ -2 & -1 & -1 \end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix} 3 & -1 & 3 \\ 5 & 3 & -5 \\ -4 & -1 & 4 \end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 1 and column 3.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} x_1 - 2x_2 - x_3 = -2 \\ x_1 + 2x_2 - x_3 = 2 \\ -3x_1 - x_2 - 2x_3 = -6 \end{cases}$ **;** **b)** $\begin{cases} 3x_1 + x_2 + 2x_3 = 1 \\ 2x_1 + 2x_2 - 3x_3 = 9 \\ x_1 - x_2 + x_3 = 2 \end{cases}$**.**

Variant 14

1. Find the inverse matrix for the matrix $A=\begin{pmatrix} 2 & 3 & 4 \\ 2 & 3 & 3 \\ 5 & 6 & 4 \end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix} 4 & -1 & 5 \\ 6 & 4 & -3 \\ -2 & 0 & 5 \end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 3 and column 2.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} 2x_1 - 2x_2 + x_3 = 1 \\ x_1 + 2x_2 - 2x_3 = 1; \\ x_1 - x_2 + x_3 = 1 \end{cases}$ b) $\begin{cases} 6x_1 + 3x_2 - 5x_3 = 0 \\ 9x_1 + 4x_2 - 7x_3 = 3. \\ 3x_1 + x_2 - 2x_3 = 5 \end{cases}$

Variant 15

1. Find the inverse matrix for the matrix $A=\begin{pmatrix} 1 & 3 & 4 \\ -2 & 0 & 3 \\ 5 & 6 & 4 \end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix} -1 & 6 & -3 \\ 1 & 5 & 0 \\ -2 & 4 & 3 \end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 2 and column 1.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} x_1+2x_2-x_3=0 \\ x_1-x_2-x_3=-3 \\ -3x_1+3x_2-2x_3=4 \end{cases}$ **;** **b)** $\begin{cases} 8x_1-x_2+3x_3=5 \\ 4x_1+x_2+6x_3=1 \\ 4x_1-2x_2-3x_3=7 \end{cases}$ **.**

Variant 16

1. Find the inverse matrix for the matrix $A=\begin{pmatrix} 5 & 1 & 3 \\ 4 & 2 & 0 \\ 2 & 4 & 5 \end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix} -3 & 3 & 3 \\ 4 & 1 & 0 \\ -5 & -2 & 6 \end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 1 and column 3.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

а) $\begin{cases} -x_1+3x_2-x_3=3 \\ x_1+2x_2-x_3=0 \\ -3x_1+x_2+x_3=5 \end{cases}$; б) $\begin{cases} 2x_1+3x_2+4x_3=5 \\ x_1+x_2+5x_3=6 \\ 3x_1+4x_2+x_3=0 \end{cases}$.

Variant 17

1. Find the inverse matrix for the matrix $A=\begin{pmatrix}3 & 4 & 2\\ 1 & 3 & 2\\ 0 & 2 & -7\end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix}4 & -1 & 3\\ 6 & 4 & -1\\ -5 & -1 & 0\end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 3 and column 2.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} x_1-2x_2-x_3=-2\\ x_1+2x_2+3x_3=2\\ -3x_1-x_2-2x_3=1\end{cases}$ **;** **b)** $\begin{cases} 2x_1-3x_2-4x_3=1\\ 7x_1-9x_2-x_3=3\\ 5x_1-6x_2+3x_3=7\end{cases}$ **.**

Variant 18

1. Find the inverse matrix for the matrix $A=\begin{pmatrix}8 & 5 & 10\\ -1 & -5 & 3\\ -1 & -1 & 2\end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix}4 & -3 & 0\\ 3 & 2 & -1\\ -2 & -1 & 4\end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 2 and column 1.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} -x_1-x_2-x_3=0\\ x_1+3x_2-x_3=-2\\ x_1-2x_2-2x_3=-3\end{cases}$; b) $\begin{cases} 5x_1+6x_2-2x_3=2\\ 2x_1+3x_2-x_3=9\\ 3x_1+3x_2-x_3=1\end{cases}$.

Variant 19

1. Find the inverse matrix for the matrix $A=\begin{pmatrix} 3 & 1 & 4 \\ -7 & -8 & -2 \\ 2 & 3 & 3 \end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix} -5 & 0 & -3 \\ 4 & 3 & 2 \\ -3 & 4 & -1 \end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 3 and column 2.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} -2x_1+3x_2-2x_3=1 \\ -x_1+x_2-x_3=0 \\ x_1-3x_2+x_3=-2 \end{cases}$; **b)** $\begin{cases} 3x_1+x_2-2x_3=6 \\ 5x_1-3x_2+2x_3=4 \\ -2x_1+5x_2-4x_3=0 \end{cases}$ **.**

Variant 20

1. Find the inverse matrix for the matrix $A=\begin{pmatrix} 3 & 3 & 4 \\ -1 & 5 & -7 \\ 0 & 1 & -1 \end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix} 7 & 5 & 0 \\ 1 & 4 & -1 \\ -3 & -3 & 2 \end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 3 and column 1.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

а) $\begin{cases} x_1+3x_2-2x_3=4 \\ -x_1+2x_2-x_3=1 \\ 3x_1-2x_2+2x_3=1 \end{cases}$; б) $\begin{cases} 2x_1+x_2+x_3=2 \\ 5x_1+x_2+3x_3=4 \\ 7x_1+2x_2+4x_3=1 \end{cases}$.

Variant 21

1. Find the inverse matrix for the matrix $A = \begin{pmatrix} 2 & 4 & 2 \\ -1 & -9 & -7 \\ -4 & 3 & -1 \end{pmatrix}$ by using two methods and check $A \cdot A^{-1}$ or $A^{-1} \cdot A$.

2. Calculate the determinant of the matrix $B = \begin{pmatrix} 5 & 2 & 3 \\ 6 & -3 & -2 \\ -7 & -4 & 0 \end{pmatrix}$ on the base of Surrus formula

and check the result using the theorem concerning the decomposition of the determinant in row 2 and column 3.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} x_1 + 2x_2 - 2x_3 = -3 \\ -x_1 + 2x_2 + x_3 = -2 \\ x_1 - x_2 + 2x_3 = 5 \end{cases}$**;** **b)** $\begin{cases} x_1 - 2x_2 - 3x_3 = 3 \\ x_1 + 3x_2 - 5x_3 = 0 \\ 2x_1 + x_2 - 8x_3 = 4 \end{cases}$**.**

Variant 22

1. Find the inverse matrix for the matrix $A = \begin{pmatrix} 8 & 1 & 1 \\ 5 & 5 & 1 \\ -1 & 3 & 0 \end{pmatrix}$ by using two methods and check $A \cdot A^{-1}$ or $A^{-1} \cdot A$.

2. Calculate the determinant of the matrix $B = \begin{pmatrix} 2 & 2 & 4 \\ 6 & 2 & 0 \\ -5 & -1 & 3 \end{pmatrix}$ on the base of Surrus formula

and check the result using the theorem concerning the decomposition of the determinant in row 1 and column 2.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} 3x_1 + 4x_2 - x_3 = -4 \\ x_1 + x_2 - 2x_3 = -2 \\ 3x_1 + x_2 - 2x_3 = 0 \end{cases}$; b) $\begin{cases} x_1 - 4x_2 - 2x_3 = 0 \\ 3x_1 - 5x_2 - 6x_3 = 2 \\ 4x_1 - 9x_2 - 8x_3 = 1 \end{cases}$.

Variant 23

1. Find the inverse matrix for the matrix $A=\begin{pmatrix} 1 & 2 & 4 \\ 1 & -4 & -3 \\ -1 & 1 & 1 \end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix} 2 & 2 & 0 \\ -2 & 6 & -2 \\ -1 & 5 & 3 \end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 3 and column 2.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} 2x_1+4x_2-2x_3=2 \\ 5x_1-3x_2+2x_3=-1; \\ 3x_1+x_2-x_3=0 \end{cases}$ **b)** $\begin{cases} 4x_1+x_2-3x_3=1 \\ 3x_1+x_2-x_3=3 \\ x_1-x_3=5 \end{cases}$ **.**

Variant 24

1. Find the inverse matrix for the matrix $A=\begin{pmatrix} 5 & 7 & 4 \\ -8 & 0 & 1 \\ -4 & -5 & 0 \end{pmatrix}$ by using two methods and check $A\cdot A^{-1}$ or $A^{-1}\cdot A$.

2. Calculate the determinant of the matrix $B=\begin{pmatrix} 3 & -2 & 5 \\ 5 & 3 & 0 \\ -6 & 4 & 1 \end{pmatrix}$ on the base of Surrus formula and check the result using the theorem concerning the decomposition of the determinant in row 1 and column 3.

3. Solve the systems using: 1) the method by Cramer; 2) an inverse matrix; 3) the method by Jordan-Gauss.

a) $\begin{cases} 4x_1-2x_2-x_3=-3 \\ -x_1+2x_2-x_3=1 \\ -2x_1-x_2-2x_3=-3 \end{cases}$; b) $\begin{cases} 3x_1-5x_2+3x_3=4 \\ x_1+2x_2+x_3=8 \\ 2x_1-7x_2+2x_3=1 \end{cases}$.