1.

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

2. $L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ -1 & -\frac{5}{9} & 1 & 0 \\ \frac{1}{3} & -\frac{11}{27} & \frac{203}{51} & 1 \end{bmatrix}, U = \begin{bmatrix} -3 & 2 & -4 & 8 \\ 0 & 9 & -7 & 0 \\ 0 & 0 & -\frac{17}{9} & 17 \\ 0 & 0 & 0 & -\frac{208}{3} \end{bmatrix}$

3.

$$\begin{pmatrix} -9 & -8 & -11 \\ -9 & -15 & -13 \\ -19 & 14 & 3 \end{pmatrix}$$

4.

$$\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 4 & 5 & 1 & 3 & 6 & 2 \end{pmatrix}$$

5.

$$\sigma = (1,4,8)(2,7,5,9,6,3), ord = 6, \sigma^{-823} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 8 & 3 & 6 & 1 & 7 & 9 & 2 & 4 & 5 \end{pmatrix} = (1,8,4)(2,3,6,9,5,7)$$

6. Id;(5, 6);(1, 2, 4, 7, 3);(1, 2, 4, 7, 3) (5, 6);
   (1, 3, 7, 4, 2);(1, 3, 7, 4, 2) (5, 6);(1, 4, 3, 2, 7);(1, 4, 3, 2, 7) (5, 6);(1, 7, 2, 3, 4);
   (1, 7, 2, 3, 4) (5, 6);

7. $\frac{28(-56)^n}{43} + \frac{15 \cdot 30^n}{43}$

8. $3 + 3*x + 0*x^2 + -2*x^3 + -3*x^4$

9. При $\lambda = -8$

10. Определитель: $31\lambda - 651$, при $\lambda = [21]$ ранг равен 3, иначе 4