1.

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

2. $L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ -\frac{1}{2} & 1 & 0 & 0 \\ -\frac{5}{2} & -\frac{31}{7} & 1 & 0 \\ 1 & -\frac{8}{7} & \frac{5}{78} & 1 \end{bmatrix}, U = \begin{bmatrix} 4 & 5 & -9 & 0 \\ 0 & -\frac{7}{2} & -\frac{21}{2} & 7 \\ 0 & 0 & -78 & 30 \\ 0 & 0 & 0 & -\frac{51}{13} \end{bmatrix}$

3.

$$\begin{pmatrix} -3 & -1 & 17 \\ -17 & 13 & -20 \\ -6 & -9 & 17 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1,8,7)(2,6,4,3,9,5), ord = 6, \sigma^{-821} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 8 & 6 & 9 & 3 & 2 & 4 & 1 & 7 & 5 \end{pmatrix} = (1,8,7)(2,6,4,3,9,5)$$

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

7. $\frac{9(-9)^n}{49} + \frac{40 \cdot 40^n}{49}$

8. $1 + 3 * x + 1 * x^2 + -2 * x^3 + 1 * x^4$

9. При $\lambda = -7$

10. Определитель: $26\lambda + 200$, при $\lambda = [-100/13]$ ранг равен 3, иначе 4