

1.

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

$$2. L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ \frac{1}{10} & 1 & 0 & 0 \\ 5 & \frac{66}{107} & 1 & 0 \\ 5 & \frac{72}{107} & -\frac{1216}{419} & 1 \end{bmatrix}, U = \begin{bmatrix} -10 & 7 & 0 & -4 \\ 0 & -\frac{107}{10} & 5 & -\frac{33}{5} \\ 0 & 0 & \frac{419}{107} & \frac{1420}{107} \\ 0 & 0 & 0 & \frac{20261}{419} \end{bmatrix}$$

3.

$$\begin{pmatrix} 12 & -7 & 4 \\ -17 & -17 & -10 \\ -10 & 9 & -10 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1, 4)(2, 5, 3, 7, 8)(6, 9), \text{ord} = 10, \sigma^{-821} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 4 & 8 & 5 & 1 & 2 & 9 & 3 & 7 & 6 \end{pmatrix} = (1, 4)(2, 8, 7, 3, 5)(6, 9)$$

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

$$7. -\frac{27 \cdot 27^n}{8} + \frac{35 \cdot 35^n}{8}$$

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

9. При $\lambda = -3$

10. Определитель: $15\lambda + 15$, при $\lambda = [-1]$ ранг равен 3, иначе 4