1.

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

2. $L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 1 & 1 & 0 & 0 \\ 2 & \frac{5}{6} & 1 & 0 \\ -3 & -\frac{10}{3} & -\frac{61}{22} & 1 \end{bmatrix}, U = \begin{bmatrix} 1 & 4 & 3 & -8 \\ 0 & -6 & -10 & 3 \\ 0 & 0 & \frac{22}{3} & \frac{21}{2} \\ 0 & 0 & 0 & \frac{225}{44} \end{bmatrix}$

3.

$$\begin{pmatrix} -10 & 8 & -10 \\ -19 & -8 & 7 \\ -16 & 10 & -18 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1,8,7)(2,3,6,4)(5,9), ord = 12, \sigma^{-797} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 8 & 4 & 2 & 6 & 9 & 3 & 1 & 7 & 5 \end{pmatrix} = (1,8,7)(2,4,6,3)(5,9)$$

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

7. $-8 \cdot 24^n + 9 \cdot 27^n$

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

9. При $\lambda = -7$

10. Определитель: $9\lambda + 2$, при $\lambda = [-2/9]$ ранг равен 3, иначе 4