1.

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

2. $L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 3 & 1 & 0 & 0 \\ -5 & 0 & 1 & 0 \\ \frac{7}{2} & -1 & -\frac{77}{58} & 1 \end{bmatrix}, U = \begin{bmatrix} 2 & 2 & 5 & 0 \\ 0 & 1 & -18 & -2 \\ 0 & 0 & 29 & 0 \\ 0 & 0 & 0 & -12 \end{bmatrix}$

3.

$$\begin{pmatrix} 2 & -9 & -20 \\ -15 & 3 & -15 \\ -16 & -5 & -13 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1,6,3,9,2)(4,8)(5,7), ord = 10, \sigma^{-773} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 3 & 6 & 2 & 8 & 7 & 9 & 5 & 4 & 1 \end{pmatrix} = (1,3,2,6,9)(4,8)(5,7)$$

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

7. $\frac{9(-54)^n}{17} + \frac{8 \cdot 48^n}{17}$

8. $4 + -3 * x + -1 * x^2 + 0 * x^3 + 2 * x^4$

9. При $\lambda = -7$

10. Определитель: $-55\lambda - 225$, при $\lambda = [-45/11]$ ранг равен 3, иначе 4