1.

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

2. $L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ -9 & \frac{71}{13} & 1 & 0 \\ -5 & \frac{41}{13} & \frac{89}{111} & 1 \end{bmatrix}, U = \begin{bmatrix} -1 & -7 & 4 & 8 \\ 0 & -13 & 2 & 11 \\ 0 & 0 & \frac{222}{13} & \frac{116}{13} \\ 0 & 0 & 0 & -\frac{427}{111} \end{bmatrix}$

3.

$$\begin{pmatrix} 18 & -8 & 13 \\ -14 & 7 & 19 \\ -3 & 6 & 6 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1,9,2,4)(3,8,5,7,6), ord = 20, \sigma^{-773} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 4 & 9 & 5 & 2 & 6 & 8 & 3 & 7 & 1 \end{pmatrix} = (1,4,2,9)(3,5,6,8,7)$$

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

7. $-\frac{3(-12)^n}{2} + \frac{5(-20)^n}{2}$

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

9. При $\lambda = -9$

10. Определитель: $30\lambda - 776$, при $\lambda = [388/15]$ ранг равен 3, иначе 4