1.

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

2. $L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ \frac{1}{3} & 1 & 0 & 0 \\ \frac{1}{9} & -\frac{3}{2} & 1 & 0 \\ -\frac{4}{9} & -7 & \frac{142}{59} & 1 \end{bmatrix}, U = \begin{bmatrix} 9 & -9 & 6 & 9 \\ 0 & 2 & 3 & -5 \\ 0 & 0 & \frac{59}{6} & -\frac{29}{2} \\ 0 & 0 & 0 & -\frac{124}{59} \end{bmatrix}$

3.

$$\begin{pmatrix} -15 & 9 & 0 \\ 18 & 17 & -4 \\ 5 & -14 & 7 \end{pmatrix}$$

4.

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

5.

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

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

7. $(-3)^n n + (-3)^n$

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

9. При $\lambda = 1$

10. Определитель: $159 - 15\lambda$, при $\lambda = [53/5]$ ранг равен 3, иначе 4