1.

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

2. $L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ -\frac{1}{8} & \frac{25}{16} & 1 & 0 \\ -1 & \frac{1}{4} & \frac{12}{43} & 1 \end{bmatrix}, U = \begin{bmatrix} 8 & -6 & 0 & 3 \\ 0 & 4 & -9 & 7 \\ 0 & 0 & \frac{129}{16} & -\frac{153}{16} \\ 0 & 0 & 0 & \frac{1111}{86} \end{bmatrix}$

3.

$$\begin{pmatrix} 1 & 3 & -2 \\ 11 & 2 & 15 \\ 2 & -13 & -4 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1,7,9,5,3,4)(2,8,6), ord = 6, \sigma^{-739} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 4 & 6 & 5 & 3 & 9 & 8 & 1 & 2 & 7 \end{pmatrix} = (1,4,3,5,9,7)(2,6,8)$$

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

7. $\frac{5(-30)^n}{4} - \frac{(-6)^n}{4}$

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

9. При $\lambda = -6$

10. Определитель: $392 - 169\lambda$, при $\lambda = [392/169]$ ранг равен 3, иначе 4