1.

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

2. $L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ \frac{1}{2} & 1 & 0 & 0 \\ -\frac{1}{5} & -\frac{4}{11} & 1 & 0 \\ \frac{9}{10} & \frac{13}{11} & -\frac{15}{8} & 1 \end{bmatrix}, U = \begin{bmatrix} -10 & 5 & 5 & -10 \\ 0 & -\frac{11}{2} & -\frac{9}{2} & -1 \\ 0 & 0 & -\frac{40}{11} & -\frac{103}{11} \\ 0 & 0 & 0 & \frac{13}{8} \end{bmatrix}$

3.

$$\begin{pmatrix} 7 & 11 & -12 \\ 8 & -11 & 4 \\ 9 & 9 & -20 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1,6,4,8)(2,9,3)(5,7), ord = 12, \sigma^{-743} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 6 & 9 & 2 & 8 & 7 & 4 & 5 & 1 & 3 \end{pmatrix} = (1,6,4,8)(2,9,3)(5,7)$$

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

7. $\frac{(-2)^n}{8} + \frac{7 \cdot 14^n}{8}$

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

9. При $\lambda = 1$

10. Определитель: $-31\lambda - 604$, при $\lambda = [-604/31]$ ранг равен 3, иначе 4