1.

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

2. $L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ \frac{8}{7} & \frac{47}{35} & 1 & 0 \\ \frac{5}{7} & -\frac{9}{7} & \frac{5}{8} & 1 \end{bmatrix}, U = \begin{bmatrix} 7 & -2 & 2 & 9 \\ 0 & -5 & 2 & 4 \\ 0 & 0 & -\frac{104}{35} & -\frac{408}{35} \\ 0 & 0 & 0 & -2 \end{bmatrix}$

3.

$$\begin{pmatrix} -11 & -4 & -1 \\ -9 & -3 & -4 \\ 3 & -18 & -12 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1,7,8,4,9,3)(2,6,5), ord = 6, \sigma^{-821} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 7 & 6 & 1 & 9 & 2 & 5 & 8 & 4 & 3 \end{pmatrix} = (1,7,8,4,9,3)(2,6,5)$$

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

7. $-\frac{3 \cdot 18^n}{5} + \frac{8 \cdot 48^n}{5}$

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

9. При $\lambda = -1$

10. Определитель: $15 - 78\lambda$, при $\lambda = [5/26]$ ранг равен 3, иначе 4