1.

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

2. $L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ -\frac{1}{2} & 1 & 0 & 0 \\ -\frac{7}{2} & -3 & 1 & 0 \\ -1 & -\frac{8}{3} & \frac{5}{4} & 1 \end{bmatrix}, U = \begin{bmatrix} 2 & 0 & -2 & 2 \\ 0 & 3 & 6 & 5 \\ 0 & 0 & 8 & 14 \\ 0 & 0 & 0 & -\frac{31}{6} \end{bmatrix}$

3.

$$\begin{pmatrix} -14 & -11 & -20 \\ -9 & -14 & -19 \\ -19 & -7 & 6 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1,4,7,8,6)(2,3,9,5), ord = 20, \sigma^{-821} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 6 & 5 & 2 & 1 & 9 & 8 & 4 & 7 & 3 \end{pmatrix} = (1,6,8,7,4)(2,5,9,3)$$

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

7. $-\frac{9 \cdot 18^n}{7} + \frac{16 \cdot 32^n}{7}$

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

9. При $\lambda = -7$

10. Определитель: $91\lambda + 107$, при $\lambda = [-107/91]$ ранг равен 3, иначе 4