1.

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

2. $L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ -8 & 1 & 0 & 0 \\ -2 & \frac{4}{31} & 1 & 0 \\ -8 & \frac{30}{31} & -\frac{65}{43} & 1 \end{bmatrix}, U = \begin{bmatrix} -1 & -3 & 6 & -5 \\ 0 & -31 & 50 & -37 \\ 0 & 0 & \frac{172}{31} & -\frac{255}{31} \\ 0 & 0 & 0 & -\frac{887}{43} \end{bmatrix}$

3.

$$\begin{pmatrix} 1 & 11 & 5 \\ 4 & 17 & -3 \\ 2 & 10 & -10 \end{pmatrix}$$

4.

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

5.

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

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

7. брак

8. $2 + 2 * x + 0 * x^2 + 1 * x^3 + -2 * x^4$

9. При $\lambda = -9$

10. Определитель: $8\lambda - 204$, при $\lambda = [51/2]$ ранг равен 3, иначе 4