1.

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

2. $L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ \frac{9}{7} & \frac{144}{7} & 1 & 0 \\ -1 & -17 & -\frac{42}{47} & 1 \end{bmatrix}, U = \begin{bmatrix} 7 & -9 & 5 & 7 \\ 0 & 1 & -4 & -1 \\ 0 & 0 & \frac{517}{7} & \frac{102}{7} \\ 0 & 0 & 0 & \frac{236}{47} \end{bmatrix}$

3.

$$\begin{pmatrix} -18 & -8 & 4 \\ -14 & -14 & -3 \\ -17 & -17 & 5 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1,2)(3,4,7,5,6)(8,9), ord = 10, \sigma^{-787} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 2 & 1 & 5 & 6 & 4 & 7 & 3 & 9 & 8 \end{pmatrix} = (1,2)(3,5,4,6,7)(8,9)$$

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

7. брак

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

9. При $\lambda = 9$

10. Определитель: $4\lambda + 424$, при $\lambda = [-106]$ ранг равен 3, иначе 4