1.

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

2. $L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ \frac{5}{6} & 1 & 0 & 0 \\ -\frac{3}{2} & \frac{1}{9} & 1 & 0 \\ 1 & \frac{1}{9} & -\frac{203}{283} & 1 \end{bmatrix}, U = \begin{bmatrix} -6 & 0 & -4 & 7 \\ 0 & -9 & \frac{13}{3} & -\frac{71}{6} \\ 0 & 0 & -\frac{283}{27} & \frac{427}{27} \\ 0 & 0 & 0 & \frac{2071}{566} \end{bmatrix}$

3.

$$\begin{pmatrix} 6 & 14 & 7 \\ -12 & 15 & -7 \\ 0 & -20 & 7 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1,6,5,3,9,4)(2,8,7), ord = 6, \sigma^{-823} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 4 & 7 & 5 & 9 & 6 & 1 & 8 & 2 & 3 \end{pmatrix} = (1,4,9,3,5,6)(2,7,8)$$

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

7. брак

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

9. При $\lambda = 9$

10. Определитель: $116\lambda - 158$, при $\lambda = [79/58]$ ранг равен 3, иначе 4