1.

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

2. $L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ -\frac{1}{6} & 1 & 0 & 0 \\ 1 & -\frac{36}{13} & 1 & 0 \\ \frac{1}{3} & -\frac{8}{13} & -\frac{7}{53} & 1 \end{bmatrix}, U = \begin{bmatrix} 6 & -8 & -7 & -1 \\ 0 & -\frac{13}{6} & -\frac{55}{6} & -\frac{7}{6} \\ 0 & 0 & -\frac{265}{13} & \frac{23}{13} \\ 0 & 0 & 0 & -\frac{379}{53} \end{bmatrix}$

3.

$$\begin{pmatrix} -10 & -6 & -10 \\ -19 & 2 & 16 \\ -10 & -19 & 16 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1,9,3,8)(2,4,6,7,5), ord = 20, \sigma^{-823} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 9 & 6 & 8 & 7 & 4 & 5 & 2 & 1 & 3 \end{pmatrix} = (1,9,3,8)(2,6,5,4,7)$$

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

7. $-9 \cdot 36^n + 10 \cdot 40^n$

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

9. При $\lambda = 1$

10. Определитель: $5\lambda + 115$, при $\lambda = [-23]$ ранг равен 3, иначе 4