1.

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

2. $L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ -\frac{2}{3} & 1 & 0 & 0 \\ -1 & \frac{4}{3} & 1 & 0 \\ \frac{4}{9} & \frac{7}{9} & \frac{169}{129} & 1 \end{bmatrix}, U = \begin{bmatrix} -9 & 3 & -7 & 5 \\ 0 & 6 & -\frac{44}{3} & \frac{7}{3} \\ 0 & 0 & \frac{86}{9} & -\frac{64}{9} \\ 0 & 0 & 0 & -\frac{31}{43} \end{bmatrix}$

3.

$$\begin{pmatrix} 1 & -3 & 4 \\ -1 & -4 & 11 \\ -4 & 1 & 19 \end{pmatrix}$$

4.

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

5.

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

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

7. $\frac{45(-90)^n}{53} + \frac{8 \cdot 16^n}{53}$

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

9. При $\lambda = 1$

10. Определитель: $65\lambda + 149$, при $\lambda = [-149/65]$ ранг равен 3, иначе 4