1.

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

2. $L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ \frac{6}{5} & 1 & 0 & 0 \\ 2 & \frac{20}{31} & 1 & 0 \\ -\frac{8}{5} & -\frac{109}{93} & -\frac{131}{1305} & 1 \end{bmatrix}, U = \begin{bmatrix} -5 & -8 & 8 & -3 \\ 0 & \frac{93}{5} & -\frac{23}{5} & -\frac{7}{5} \\ 0 & 0 & -\frac{435}{31} & \frac{431}{31} \\ 0 & 0 & 0 & -\frac{11804}{1305} \end{bmatrix}$

3.

$$\begin{pmatrix} -18 & -4 & 1 \\ -14 & 12 & 1 \\ -1 & 1 & -14 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1,4,2,5,8,9)(3,6,7), ord = 6, \sigma^{-827} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 4 & 5 & 6 & 2 & 8 & 7 & 3 & 9 & 1 \end{pmatrix} = (1,4,2,5,8,9)(3,6,7)$$

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

7. $-\frac{12^n}{2} + \frac{3 \cdot 36^n}{2}$

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

9. При $\lambda = 5$

10. Определитель: $-16\lambda - 82$, при $\lambda = [-41/8]$ ранг равен 3, иначе 4