

1.

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

$$2. L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ \frac{2}{3} & 1 & 0 & 0 \\ 1 & \frac{12}{31} & 1 & 0 \\ 0 & -\frac{12}{31} & \frac{13}{18} & 1 \end{bmatrix}, U = \begin{bmatrix} -6 & 2 & -9 & 7 \\ 0 & -\frac{31}{3} & 1 & -\frac{8}{3} \\ 0 & 0 & \frac{360}{31} & -\frac{433}{31} \\ 0 & 0 & 0 & \frac{253}{18} \end{bmatrix}$$

3.

$$\begin{pmatrix} 2 & -17 & -14 \\ 15 & 2 & 15 \\ 18 & 5 & -18 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1, 7, 8, 4, 3, 2, 5)(6, 9), \text{ord} = 14, \sigma^{-827} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 5 & 3 & 4 & 8 & 2 & 9 & 1 & 7 & 6 \end{pmatrix} = (1, 5, 2, 3, 4, 8, 7)(6, 9)$$

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

$$7. \frac{(-8)^n}{2} + \frac{8^n}{2}$$

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

9. При $\lambda = -3$

10. Определитель: $64 - 60\lambda$, при $\lambda = [16/15]$ ранг равен 3, иначе 4