

1.

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

$$2. L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ -\frac{1}{4} & 1 & 0 & 0 \\ -\frac{1}{4} & \frac{5}{3} & 1 & 0 \\ -\frac{1}{2} & 8 & \frac{137}{37} & 1 \end{bmatrix}, U = \begin{bmatrix} 8 & -10 & 7 & 5 \\ 0 & -\frac{3}{2} & -\frac{33}{4} & \frac{25}{4} \\ 0 & 0 & \frac{37}{2} & -\frac{49}{6} \\ 0 & 0 & 0 & -\frac{1472}{111} \end{bmatrix}$$

3.

$$\begin{pmatrix} -13 & -10 & 15 \\ -5 & -9 & 0 \\ -5 & -6 & -19 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1, 5)(2, 4, 8, 6, 7, 9, 3), \text{ord} = 14, \sigma^{-727} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 5 & 4 & 2 & 8 & 1 & 7 & 9 & 6 & 3 \end{pmatrix} = (1, 5)(2, 4, 8, 6, 7, 9, 3)$$

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

7. $-8 \cdot 40^n + 9 \cdot 45^n$

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

9. При $\lambda = -2$

10. Определитель: $55\lambda + 128$, при $\lambda = [-128/55]$ ранг равен 3, иначе 4