

1.

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

$$2. L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ \frac{2}{7} & 1 & 0 & 0 \\ \frac{8}{7} & \frac{76}{61} & 1 & 0 \\ \frac{10}{7} & \frac{123}{61} & \frac{97}{174} & 1 \end{bmatrix}, U = \begin{bmatrix} -7 & -6 & -4 & -4 \\ 0 & \frac{61}{7} & -\frac{48}{7} & \frac{43}{7} \\ 0 & 0 & \frac{1044}{61} & \frac{117}{61} \\ 0 & 0 & 0 & -\frac{797}{58} \end{bmatrix}$$

3.

$$\begin{pmatrix} -2 & 14 & 14 \\ 6 & 3 & 16 \\ 14 & 0 & 8 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1, 8, 6, 5, 2, 9, 7)(3, 4), \text{ord} = 14, \sigma^{-751} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 9 & 6 & 4 & 3 & 8 & 1 & 2 & 7 & 5 \end{pmatrix} = (1, 9, 5, 8, 7, 2, 6)(3, 4)$$

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

$$7. \frac{7(-7)^n}{37} + \frac{30 \cdot 30^n}{37}$$

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

9. При  $\lambda = 1$

10. Определитель:  $-\lambda - 196$ , при  $\lambda = [-196]$  ранг равен 3, иначе 4