

1.

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

$$2. L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ -1 & \frac{6}{7} & 1 & 0 \\ 1 & -\frac{1}{7} & \frac{19}{68} & 1 \end{bmatrix}, U = \begin{bmatrix} -4 & 8 & 4 & -1 \\ 0 & 7 & 9 & 5 \\ 0 & 0 & -\frac{68}{7} & -\frac{23}{7} \\ 0 & 0 & 0 & -\frac{297}{68} \end{bmatrix}$$

3.

$$\begin{pmatrix} 2 & -20 & 9 \\ 10 & 3 & 15 \\ -12 & 13 & 18 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1, 4, 8, 2)(3, 7, 6, 5, 9), \text{ord} = 20, \sigma^{-727} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 4 & 1 & 5 & 8 & 7 & 3 & 9 & 2 & 6 \end{pmatrix} = (1, 4, 8, 2)(3, 5, 7, 9, 6)$$

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

$$7. \frac{5(-90)^n}{6} + \frac{18^n}{6}$$

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

9. При  $\lambda = 4$

10. Определитель:  $2\lambda - 228$ , при  $\lambda = [114]$  ранг равен 3, иначе 4