

1.

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

$$2. L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ -\frac{3}{7} & 1 & 0 & 0 \\ \frac{8}{7} & -\frac{17}{72} & 1 & 0 \\ \frac{3}{7} & -1 & 0 & 1 \end{bmatrix}, U = \begin{bmatrix} -7 & 3 & 5 & -10 \\ 0 & \frac{72}{7} & \frac{1}{7} & -\frac{37}{7} \\ 0 & 0 & \frac{23}{72} & \frac{1165}{72} \\ 0 & 0 & 0 & 8 \end{bmatrix}$$

3.

$$\begin{pmatrix} -15 & 4 & -8 \\ -10 & -7 & -9 \\ -20 & 6 & 5 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1, 7, 9, 8, 5)(2, 3, 4, 6), \text{ord} = 20, \sigma^{-811} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 5 & 3 & 4 & 6 & 8 & 2 & 1 & 9 & 7 \end{pmatrix} = (1, 5, 8, 9, 7)(2, 3, 4, 6)$$

6. Id; (3, 4, 6, 7); (3, 6) (4, 7); (3, 7, 6, 4);

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

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

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

9. При $\lambda = -3$

10. Определитель: $39 - 8\lambda$, при $\lambda = [39/8]$ ранг равен 3, иначе 4