

1.

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

$$2. L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ -\frac{1}{5} & 1 & 0 & 0 \\ \frac{3}{5} & -\frac{19}{53} & 1 & 0 \\ \frac{2}{5} & -\frac{31}{53} & -\frac{41}{33} & 1 \end{bmatrix}, U = \begin{bmatrix} 5 & -8 & 9 & -1 \\ 0 & -\frac{53}{5} & \frac{49}{5} & -\frac{11}{5} \\ 0 & 0 & \frac{165}{53} & -\frac{116}{53} \\ 0 & 0 & 0 & \frac{178}{33} \end{bmatrix}$$

3.

$$\begin{pmatrix} 6 & 10 & -9 \\ -16 & 7 & 7 \\ -8 & -19 & -11 \end{pmatrix}$$

4.

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

5.

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

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

$$7. -\frac{4(-12)^n}{17} + \frac{21(-63)^n}{17}$$

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

9. При $\lambda = -10$

10. Определитель: $120 - 40\lambda$, при $\lambda = [3]$ ранг равен 3, иначе 4