

1.

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

$$2. L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ \frac{4}{9} & 1 & 0 & 0 \\ \frac{1}{3} & \frac{12}{73} & 1 & 0 \\ \frac{7}{9} & -\frac{5}{73} & -\frac{303}{187} & 1 \end{bmatrix}, U = \begin{bmatrix} 9 & -2 & -6 & -5 \\ 0 & -\frac{73}{9} & \frac{8}{3} & \frac{47}{9} \\ 0 & 0 & \frac{187}{73} & \frac{351}{73} \\ 0 & 0 & 0 & \frac{1316}{187} \end{bmatrix}$$

3.

$$\begin{pmatrix} -20 & -18 & 2 \\ -2 & -4 & -3 \\ -12 & 7 & 14 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1, 3, 9, 7, 2)(4, 6, 8, 5), \text{ord} = 20, \sigma^{-827} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 7 & 9 & 2 & 6 & 4 & 8 & 3 & 5 & 1 \end{pmatrix} = (1, 7, 3, 2, 9)(4, 6, 8, 5)$$

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

7. брак

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

9. При $\lambda = 4$

10. Определитель: $148 - 42\lambda$, при $\lambda = [74/21]$ ранг равен 3, иначе 4