

1.

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

$$2. L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ -\frac{2}{3} & 1 & 0 & 0 \\ \frac{4}{3} & 0 & 1 & 0 \\ -\frac{8}{3} & \frac{4}{9} & -\frac{800}{207} & 1 \end{bmatrix}, U = \begin{bmatrix} 3 & 3 & 8 & -4 \\ 0 & 9 & -\frac{2}{3} & -\frac{11}{3} \\ 0 & 0 & -\frac{23}{3} & \frac{4}{3} \\ 0 & 0 & 0 & -\frac{544}{69} \end{bmatrix}$$

3.

$$\begin{pmatrix} 9 & 10 & -20 \\ 2 & 1 & -2 \\ -17 & -9 & 17 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1, 5, 9, 2, 8, 4)(3, 7, 6), \text{ord} = 6, \sigma^{-821} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 5 & 8 & 7 & 1 & 9 & 3 & 6 & 4 & 2 \end{pmatrix} = (1, 5, 9, 2, 8, 4)(3, 7, 6)$$

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

$$7. -\frac{5(-10)^n}{4} + \frac{9(-18)^n}{4}$$

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

9. При  $\lambda = 1$

10. Определитель:  $3\lambda + 44$ , при  $\lambda = [-44/3]$  ранг равен 3, иначе 4