1.

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

2. $L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ \frac{3}{2} & 1 & 0 & 0 \\ \frac{9}{2} & 35 & 1 & 0 \\ -\frac{5}{2} & -9 & -\frac{11}{30} & 1 \end{bmatrix}, U = \begin{bmatrix} 2 & -6 & 5 & 3 \\ 0 & 1 & -\frac{3}{2} & -\frac{3}{2} \\ 0 & 0 & 30 & 31 \\ 0 & 0 & 0 & \frac{311}{30} \end{bmatrix}$

3.

$$\begin{pmatrix} 4 & -11 & 5 \\ 15 & 6 & 1 \\ -6 & -20 & -6 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1,2,8,3,4,5,6)(7,9), ord = 14, \sigma^{-797} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 2 & 8 & 4 & 5 & 6 & 1 & 9 & 3 & 7 \end{pmatrix} = (1,2,8,3,4,5,6)(7,9)$$

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

7. $10(-10)^n - 9(-9)^n$

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

9. При $\lambda = -7$

10. Определитель: $-8\lambda - 450$, при $\lambda = [-225/4]$ ранг равен 3, иначе 4