1.

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

2. $L = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 3 & 1 & 0 \\ -2 & \frac{8}{3} & -\frac{2}{9} & 1 \end{bmatrix}, U = \begin{bmatrix} 1 & 9 & 8 & -1 \\ 0 & 3 & 6 & -2 \\ 0 & 0 & -18 & 5 \\ 0 & 0 & 0 & \frac{67}{9} \end{bmatrix}$

3.

$$\begin{pmatrix} -7 & -3 & 2 \\ 12 & 1 & -12 \\ 18 & -11 & 8 \end{pmatrix}$$

4.

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

5.

$$\sigma = (1,4,8,9,6)(2,7,3,5), ord = 20, \sigma^{-821} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 6 & 5 & 7 & 1 & 3 & 9 & 2 & 4 & 8 \end{pmatrix} = (1,6,9,8,4)(2,5,3,7)$$

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

7. $\frac{5(-20)^n}{6} + \frac{4^n}{6}$

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

9. При $\lambda = 9$

10. Определитель: $40\lambda - 109$, при $\lambda = [109/40]$ ранг равен 3, иначе 4