Step-1

We have $A^{-1}A = I$

$$\Rightarrow \frac{C^T}{|A|}A = I$$

$$\Rightarrow C^T A = |A|I$$

$$= |A| \begin{bmatrix} 1 & 0 & - & 0 \\ 0 & 1 & - & 0 \\ - & - & - & - \\ 0 & 0 & - & 1 \end{bmatrix}$$

$$= \begin{bmatrix} |A| & 0 & - & 0 \\ 0 & |A| & - & 0 \\ - & - & - & - \\ 0 & 0 & - & |A| \end{bmatrix}$$

Step-2

Applying determinant on both sides, we get $|C^T A| = |A|^n$

By the properties of determinants, we get $|C^T||A| = |A|^n$

$$|C^T| = |A|^{n-1}$$

$$\therefore |C| = |A|^{n-1}$$