Step-1

If A is a
$$n \times n$$
 matrix, then
$$A^{-1} = \frac{C^{T}}{|A|} \widehat{a} \in \widehat{A}^{1}(1)$$

We know that every cofactor A_{ij} of the entries of A.

So, multiplying each of them with their respective sign $(-1)^{i+j}$ and then transposing the matrix, we get C^T

(1) can be written as $|A|A^{-1} = C^T$

Or, using det A = 1, we get $A^{-1} = C^T$ $\hat{a} \in \hat{a} \in \hat{a} \in \hat{a}$

Consequently, $|A^{-1}| = |C^T|$

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

= $|A|^{n-1}$ By the properties of determinants.

=1 $\hat{a}\in \hat{a}\in (3)$

Step-2

While the cofactor matrix of A is equal to A^{-1} , we follow that the cofactor matrix of A^{-1} is nothing but A.

But the cofactor matrix of C^T is C itself.

Therefore, A = C.