

Definition: If A is a square matrix and there exists a matrix C such that $CA = I$, then C is called an **inverse** of A and A is said to be **invertible**.

note: The matrix inverse, when it exists, is unique. Since a matrix A has only one inverse, we refer to it as the inverse of A and denote it by A^{-1} .

note: Generally, $AB \neq BA$, but $AA^{-1} = I = A^{-1}A$.

note: If A is an invertible matrix, then the matrix equation $AX = B$ has the unique solution $X = A^{-1}B$.

note: The use of the matrix inverse to solve a linear system depends on two conditions:

1. The system must have the same number of equations as there are unknowns.
2. The coefficient matrix must be invertible.