



Properties of Inverse of a matrix

Generally, $AB = 0 \nRightarrow A = 0$ or $B = 0$

$$AB = 0 \begin{cases} \text{both are singular matrices} \\ \text{if one is non singular, other will be a null matrix.} \end{cases}$$

Proof: $AB = 0$

$$\Rightarrow |AB| = 0 \Rightarrow |A| \cdot |B| = 0$$

If A is non singular $|A| \neq 0 \Rightarrow A^{-1}$ exists

$$A \cdot B = 0 \quad (\text{Premultiply by } A^{-1})$$

$$A^{-1}AB = 0 \Rightarrow B = 0$$