The Inverse of a Matrix

Section 2.3

Theorem

If A is invertible, then the inverse is **unique**.

Theorem

Let A be $n \times n$ and invertible.

Then, for all $\mathbf{b} \in \mathbb{R}^n$, $A\mathbf{x} = \mathbf{b}$ has a unique solution given by $\mathbf{x} = A^{-1}\mathbf{b}$.

Solve the system.

$$-x_1 + 2x_2 = 5$$

$$-x_1 + x_2 = 7$$

Theorem

(Properties of Inverse Matrices)

1. $\left(A^{-1}\right)^{-1} = A$
2. $\left(AB\right)^{-1} = B^{-1}A^{-1}$
3. $\left(A^{T}\right)^{-1} = \left(A^{-1}\right)^{T}$