Compute Inverse Matrix

Sunday, May 28, 2023 2:08 PM

Using Reduced Row Echelon Form

Not all Matrix will have inverse matrix

$$A\,A^{-1} = I$$

2×2

$$A = \begin{pmatrix} 4 & 3 \\ 3 & 2 \end{pmatrix}$$

Step 1

$$\begin{pmatrix} 4 & 3 & 1 & 0 \\ 3 & 2 & 0 & 1 \end{pmatrix} \sim R_1 \to R_1 - R_2 \quad \begin{pmatrix} 1 & 1 & 1 & -1 \\ 3 & 2 & 0 & 1 \end{pmatrix}$$

$$\sim R_2 \to R_2 - 3R_1 \quad \begin{pmatrix} 1 & 1 & 1 & -1 \\ 0 & -1 & -3 & 4 \end{pmatrix}$$

$$\sim R_1 \to R_1 + R_2 \quad \begin{pmatrix} 1 & 0 & -2 & 3 \\ 0 & -1 & -3 & 4 \end{pmatrix}$$

Use tech of RREF

$R_2 \to -1R_2$

$$\left(\begin{array}{cc|cc} 1 & 0 & 2 & 3 \\ 0 & 1 & 3 & -4 \end{array}\right) \qquad A^{-1}$$

$$\begin{bmatrix} -2 & 3 \\ 3 & -4 \end{bmatrix}$$