

5.2.23

EE25BTECH11020 - Darsh Pankaj Gajare

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Question:

Using elementary transformations, find inverse of the matrix $\begin{pmatrix} 2 & 1 \\ 7 & 4 \end{pmatrix}$

Solution:

Table

A	$\begin{pmatrix} 2 & 1 \\ 7 & 4 \end{pmatrix}$
I	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

$$\mathbf{AA}^{-1} = \mathbf{I} \quad (0.1)$$

Using Augmented matrix,

$$\left(\begin{array}{cc|cc} 2 & 1 & 1 & 0 \\ 7 & 4 & 0 & 1 \end{array} \right) \quad (0.2)$$

$$R_2 = R_2 - 3R_1$$

$$\left(\begin{array}{cc|cc} 2 & 1 & 1 & 0 \\ 1 & 1 & -3 & 1 \end{array} \right) \quad (0.3)$$

$$R_1 = R_1 - R_2$$

$$\left(\begin{array}{cc|cc} 1 & 0 & 4 & -1 \\ 1 & 1 & -3 & 1 \end{array} \right) \quad (0.4)$$

$$R_2 = R_2 - R_1$$

$$\left(\begin{array}{cc|cc} 1 & 0 & 4 & -1 \\ 0 & 1 & -7 & 2 \end{array} \right) \quad (0.5)$$

$$\mathbf{A}^{-1} = \begin{pmatrix} 4 & -1 \\ -7 & 2 \end{pmatrix} \quad (0.6)$$