5.4.1

EE25BTECH11006-ADUDOTLA SRIVIDYA

Question:
Using elementary transformations, find the inverse of the following matrix.

$$\begin{pmatrix} 2 & 3 \\ -4 & -6 \end{pmatrix}$$

Solution:
using row reductions:

$$\begin{pmatrix} 2 & 3 \\ -4 & -6 \end{pmatrix} \xrightarrow{R_2 \to \frac{R_2}{-2}} \begin{pmatrix} 2 & 3 \\ 2 & 3 \end{pmatrix} \tag{0.1}$$

$$R_2 \to R_2 - R_1 \implies \begin{pmatrix} 2 & 3 \\ 0 & 0 \end{pmatrix} \tag{0.2}$$

since one row becomes zero, the matrix cannot be reduced to the identity matrix hence, the given matrix is **not invertible**.