Step-1

Consider the following matrices:

$$A=\begin{bmatrix}1 & 2\\ 4 & 5\\ 2 & 7\end{bmatrix}\begin{bmatrix}3 & 0 & 3\\ 1 & 1 & 2\end{bmatrix}$$

Suppose that,

$$B=\begin{bmatrix}1 & 2\\ 4 & 5\\ 2 & 7\end{bmatrix}$$

And

$$C=\begin{bmatrix}3 & 0 & 3\\ 1 & 1 & 2\end{bmatrix}$$

Step-2

We need to find the basis of $\mathbf{row}(C)$,

$$C=\begin{bmatrix}3 & 0 & 3\\ 1 & 1 & 2\end{bmatrix}$$

By using $R_1 \to \frac{R_1}{3}$, we get

$$\begin{bmatrix}1 & 0 & 1\\ 1 & 1 & 2\end{bmatrix}$$

By using $R_2 \to R_2 - R_1$, we get

$$\begin{bmatrix}1 & 0 & 1\\ 0 & 1 & 1\end{bmatrix}$$

Therefore,

$$\mathbf{Row\ space\ basis} = \left(\begin{bmatrix}1 & 0 & 1\end{bmatrix}, \begin{bmatrix}0 & 1 & 1\end{bmatrix}\right)$$

Step-3

Now, we shall find the basis of $\mathbf{col}(B)$,

$$B=\begin{bmatrix}1 & 2\\ 4 & 5\\ 2 & 7\end{bmatrix}$$

By using $R_2 \to R_2 - 4R_1$ and $R_3 \to R_3 - 2R_1$ we get.

$$\begin{bmatrix}1 & 2\\ 0 & -3\\ 0 & 3\end{bmatrix}$$

By using $R_3 \to R_3 + R_2$, we get.

$$\begin{bmatrix}1 & 2\\ 0 & -3\\ 0 & 0\end{bmatrix}$$

Therefore,

$$\textbf{Column space basis}=\left(\begin{bmatrix}1\\ 4\\ 2\end{bmatrix}, \begin{bmatrix}2\\ 5\\ 7\end{bmatrix}\right)$$

Step-4

We know that, an inverse exists only when the rank is as large as possible.

Here the rank of $\mathbf{row}(C)$ is 2 and the rank of $\mathbf{col}(B)$ is 2.

Now, matrix A is 3×3 and $\mathbf{rank}(A)=\mathbf{rank}(B)<3$, therefore matrix A is $\boxed{\textbf{not invertible}}$.