Step-1

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Suppose B has the columns of A in reverse order.

We have to solve (A-B)x = 0 to show that A-B is not invertible.

Step-2

$$A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$$
 be any matrix

Then by definition of the matrix *B*, we get $B = \begin{bmatrix} c & d \\ a & b \end{bmatrix}$

Now

$$A - B = \begin{bmatrix} a & b \\ c & d \end{bmatrix} - \begin{bmatrix} c & d \\ a & b \end{bmatrix}$$
$$= \begin{bmatrix} a - c & b - d \\ c - a & d - b \end{bmatrix}$$

Step-3

Now the system (A-B)x = 0 is $\begin{bmatrix} a-c & b-d \\ c-a & d-b \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$

Subtracting row 1 from row 2 gives $\begin{bmatrix} a-c & b-d \\ 0 & 0 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$

In the above elimination, the last column becomes zero.

Therefore, the system has no solution.

Hence A - B is not invertible.