Step-1

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a) Given statement is â€˜If A is invertible and its rows are in reverse order in B, then B is invertibleâ€™.

We have to determine whether the given statement is true or false.

Step-2

The given statement is **true**.

Since changing of order of elements does not alter its magnitude.

Hence B is invertible.

Step-3

(b) Given statement is â€˜If A and B are symmetric then AB is symmetricâ€™.

We have to determine whether the given statement is true or false.

Step-4

The given statement is **false.**

Since

$$\begin{aligned}(AB)^T &= B^T A^T \\ &= BA \qquad \begin{pmatrix}\text{Since } A \text{ and } B \text{ are symmetric} \\ \text{So } A^T = A \text{ and } B^T = B\end{pmatrix}\end{aligned}$$

From this, we get AB is symmetric if and only if $AB = BA$.

Hence the given statement is **false**.

Step-5

(c) Given statement is â€˜If A and B are invertible then BA is invertibleâ€™.

We have to determine whether the given statement is true or false.

Step-6

The given statement is **true**.

Since $(BA)^{-1} = A^{-1}B^{-1}$ and A^{-1} and B^{-1} exists.

So $(BA)^{-1}$ is also exists.

Therefore, BA is invertible.

Hence the given statement is **true.**

Step-7

d) Given statement is â€˜Every nonsingular matrix can be factored into the product $A = LU$ of a lower triangular L and an upper triangular U.

We have to determine whether the given statement is true or false.

Step-8

The given statement is **true**.

Since every non singular matrix A is the product of elementary matrices.

So it can be factorized into $A = LU$.

Hence the given statement is **true.**