

## Step-1

We have to draw the cuts in  $A$ ,  $B$  and  $AB$  to show how each of the four multiplication rules is really a block multiplication to find  $AB$ .

## Step-2

Block multiplication is 
$$\begin{bmatrix} A & B \end{bmatrix} \begin{bmatrix} C \\ D \end{bmatrix} = \begin{bmatrix} AC + BD \end{bmatrix}$$

(a) Matrix  $A$  times columns of  $B$  is  $A \begin{bmatrix} | & | & | \end{bmatrix}$

## Step-3

(b) Rows of  $A$  times matrix  $B$  is  $\begin{bmatrix} \equiv \end{bmatrix} B$

## Step-4

(c) Rows of  $A$  times columns of  $B$  is  $\begin{bmatrix} \equiv \end{bmatrix} \begin{bmatrix} | & | & | \end{bmatrix}$

## Step-5

(d) Columns of  $A$  times rows of  $B$  is  $\begin{bmatrix} | & | & | \end{bmatrix} \begin{bmatrix} \equiv \end{bmatrix}$