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 $\begin{bmatrix} = \end{bmatrix} B$

Step-4

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

Step-5

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