Multiplying Matrices

Name _____

Date _____ Period _____

Given A and B, the product AB is only defined if...
the number of columns in A is equal to the number of rows in B.

Dimensions
rows × columns

$$A \cdot B = AB$$

$$m \times n \quad n \times p \qquad m \times p$$

Yes, the product AB is defined.
The dimensions of the product AB is $m \times p$

Determine if the following products are defined? If so, what are the dimensions of the product?

$$\begin{bmatrix} 4 & -2 & -3 \\ -1 & 7 & 9 \end{bmatrix} \times \begin{bmatrix} 4 & 2 & -3 \\ -3 & 1 & 6 \\ 5 & 4 & -3 \end{bmatrix}$$

$$\begin{bmatrix} 4 & 2 \\ -3 & 1 \end{bmatrix} \times \begin{bmatrix} 3 & 2 & -3 & 8 & 0 \\ -3 & 1 & 5 & 1 & 4 \end{bmatrix}$$

$$\begin{bmatrix} 4 & -2 & -3 \\ -1 & 7 & 9 \end{bmatrix} \times \begin{bmatrix} -2 & 0 \\ 4 & -5 \end{bmatrix}$$

$$\begin{bmatrix} 4 & 2 \\ -3 & 1 \end{bmatrix} \times \begin{bmatrix} 1 & 4 \\ 3 & -7 \end{bmatrix}$$

$$\begin{bmatrix} 2 & -1 \\ 0 & 5 \end{bmatrix} \times \begin{bmatrix} 4 & -2 \\ 4 & -3 \end{bmatrix}$$

$$\begin{bmatrix} 3 & -2 \\ -1 & 0 \end{bmatrix} \times \begin{bmatrix} 4 & -2 & -3 \\ -1 & 7 & 9 \end{bmatrix}$$

$$\begin{bmatrix} 4 & -2 & -3 \\ -1 & 7 & 9 \end{bmatrix} \times \begin{bmatrix} 4 & 2 \\ -3 & 1 \\ 6 & 8 \end{bmatrix}$$

$$\begin{bmatrix} 4 & -2 & -3 \\ -1 & 7 & 9 \end{bmatrix} \times \begin{bmatrix} -2 & 0 \\ 4 & -5 \end{bmatrix}$$

Given A and B, the product AB is only defined if...
the number of columns in A is equal to the number of rows in B.

Dimensions
rows × columns

$$A \cdot B = AB$$
$$m \times n \quad n \times p \qquad m \times p$$

Yes, the product AB is defined.
The dimensions of the product AB is $m \times p$
Align row entries of A with column entries of B