Matrix Multiplication

Note: a matrices dimension is determined as **rows x columns**

EX: $\begin{bmatrix} 2 & 8 \\ 3 & 6 \\ 4 & 4 \end{bmatrix}$ is a **3x2** because it is three **rows** down and 2 **columns** across

In order to multiply- the column space of the first matrix must match the row space of the second:

EX: $\begin{bmatrix} 2 & 8 \\ 3 & 6 \\ 4 & 4 \end{bmatrix} \cdot [\quad] \rightarrow$ **3x2 · __x__**

will give us an answer matrix with dimension of ___ x ___

EX: $\boldsymbol{A} \cdot \boldsymbol{B} = \begin{bmatrix} 2 & 8 \\ 3 & 6 \\ 4 & 4 \end{bmatrix} \cdot \begin{bmatrix} 2 & 3 \\ -1 & 1 \end{bmatrix}$ **since it is 3x2 · 2x2 the answer will be a 3x2**

First write the first ROW of A two times because B has two columns.

$$\begin{bmatrix} 2(\ ) + 8(\ ) & 2(\ ) + 8(\ ) \\ 3(\ ) + 6(\ ) & 3(\ ) + 6(\ ) \\ 4(\ ) + 4(\ ) & 4(\ ) + 4(\ ) \end{bmatrix}$$

We will then fill in the **COLUMNS** in the ( )

$$\begin{bmatrix} 2(\ ) + 8(\ ) & 2(\ ) + 8(\ ) \\ 3(\ ) + 6(\ ) & 3(\ ) + 6(\ ) \\ 4(\ ) + 4(\ ) & 4(\ ) + 4(\ ) \end{bmatrix} = \begin{bmatrix} \_\_\_ & \_\_\_ \\ \_\_\_ & \_\_\_ \\ \_\_\_ & \_\_\_ \end{bmatrix}$$

ID: 1

Algebra 2 Name________________________

Assignment

Date________________ Period____

Simplify. Write "undefined" for expressions that are undefined.

1) $\begin{bmatrix} 3 & 6 \\ -3 & 5 \end{bmatrix} \cdot \begin{bmatrix} 2 & -2 \\ -4 & -1 \end{bmatrix}$

2) $\begin{bmatrix} 3 & 0 & 3 \\ -3 & 1 & -3 \end{bmatrix} \cdot \begin{bmatrix} 5 & -1 \\ 6 & 2 \\ 2 & 3 \end{bmatrix}$

3) $\begin{bmatrix} 3 & -3 \\ -4 & 2 \\ -4 & 0 \end{bmatrix} \cdot \begin{bmatrix} -1 & -1 \\ -1 & -2 \end{bmatrix}$

4) $\begin{bmatrix} 5 & -6 \\ -5 & 3 \\ 6 & -2 \end{bmatrix} \cdot \begin{bmatrix} -6 & 1 \\ 4 & 3 \end{bmatrix}$

5) $\begin{bmatrix} 5 & -2 & 5 \\ -2 & -2 & 5 \end{bmatrix} \cdot \begin{bmatrix} -4 & -2 \\ 6 & -2 \\ -1 & -4 \end{bmatrix}$

6) $\begin{bmatrix} 5 & 2 \\ 1 & 4 \end{bmatrix} \cdot \begin{bmatrix} 1 & 0 \\ 0 & 4 \end{bmatrix}$

7) $\begin{bmatrix} 6 & -2 \\ -3 & 4 \end{bmatrix} \cdot \begin{bmatrix} 0 & -4 \\ -2 & 4 \end{bmatrix}$

8) $\begin{bmatrix} 4 & -3 & -5 \\ -4 & -1 & -5 \end{bmatrix} \cdot \begin{bmatrix} 3 & 4 \\ 3 & -2 \\ -5 & -6 \end{bmatrix}$

9) $\begin{bmatrix} -4 \\ -3 \\ 0 \end{bmatrix} \cdot \begin{bmatrix} -2 & -1 \end{bmatrix}$

10) $\begin{bmatrix} -5 & -2 \\ 5 & 6 \end{bmatrix} \cdot \begin{bmatrix} -3 & 2 & 4 \\ -4 & -6 & -1 \end{bmatrix}$

11) $\begin{bmatrix} 6 & 3 \\ -2 & -3 \end{bmatrix} \cdot \begin{bmatrix} 6 & 5 \\ 2 & -4 \end{bmatrix}$

12) $\begin{bmatrix} -3 & 0 \\ 2 & -2 \\ -5 & -3 \end{bmatrix} \cdot \begin{bmatrix} 3 & -1 \\ -4 & 2 \end{bmatrix}$

13) $\begin{bmatrix} -2 & -1 \\ 1 & 4 \\ -3 & 0 \end{bmatrix} \cdot \begin{bmatrix} -5 & 1 \\ -5 & -3 \end{bmatrix}$

14) $\begin{bmatrix} -4 & -3 \\ 3 & 3 \end{bmatrix} \cdot \begin{bmatrix} 2 & -1 & -2 \\ -3 & -4 & 1 \end{bmatrix}$

15) $\begin{bmatrix} -1 & -5 \\ 5 & 0 \end{bmatrix} \cdot \begin{bmatrix} -1 & 3 & 1 \\ -4 & 0 & -5 \end{bmatrix}$

16) $\begin{bmatrix} 3 & 2 & 4 \\ 0 & -1 & -2 \end{bmatrix} \cdot \begin{bmatrix} -1 & -2 \\ 4 & 6 \\ 2 & -6 \end{bmatrix}$