Multiplying Matrices Name: _____

Multiply by hand. Write "undefined" if multiplication is not possible.

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

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

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

4) $\begin{bmatrix} -4 & -y \\ -2x & -4 \end{bmatrix} \cdot \begin{bmatrix} -4x & 0 \\ 2y & -5 \end{bmatrix}$

For Exercises 5-8, tell whether each statement is always, sometimes, or never true for matrices *A* and *B*. Give a counterexample if the statement is either sometimes or never true.

5) If *A* is 2 X 3 and *B* has three rows, then *AB* is defined.

6) If *A* is 2 X 3 and *B* has three columns, then *AB* is defined.

7) If *AB* is defined, then *BA* is defined.

8) If both *AB* and *BA* are defined, both are square matrices.

9) When multiplying AB, the solution matrix is a 5x3. Can you multiply BA?

10) True or false? If false, give a counterexample.

"If two matrices can be added, then they cannot be multiplied."

Use a calculator for the following questions.

11) Contestants in a reality TV show need to get to a location given by entries in the following matrix product:

$$P = \begin{bmatrix} 5 & 1 \\ -11 & 2 \end{bmatrix} \begin{bmatrix} 5 & -2 \\ 9 & -3 \end{bmatrix}$$

Latitude: p_{21} (north if positive, south if negative)

Longitude: p_{12} (east if positive, west if negative)

What is the location that the contestants must make their way to?

12) The number of menu items sold at three locations during one day at a theme park is shown in the table below. The price of each menu item is also listed. Determine the total sales at each location and then the total sales for the theme park that day.

	Menu Items			
Location	***Soft Pretzels***	***Cotton Candy***	***Popcorn***	***Hot Dogs***
Great America	*150*	*117*	*410*	*490*
Key Lime Cove	*237*	*160*	*215*	*275*
Wilderness Lodge	*160*	*0*	*178*	*188*

	Price
Soft Pretzels	*$6.50*
Cotton Candy	*$5*
Popcorn	*$5.50*
Hot Dogs	*$6.95*