Name _____ Period _____

More Matrix Amazingness

1. Austin is in charge of organizing some information for sports teams and ordering what they need. Multiply the matrices below to find the cost of buying the items for each team from the two different stores.

$$\begin{matrix} & Jerseys & Hats \\ Heat \\ Irish \\ Tigers \end{matrix}\begin{bmatrix} 12 & 10 \\ 5 & 14 \\ 10 & 6 \end{bmatrix} \times \begin{matrix} & Sports\ Home & Best\ Deals \\ cost\ per\ Jersery \\ cost\ per\ Hat \end{matrix}\begin{bmatrix} 20 & 10 \\ 10 & 15 \end{bmatrix}$$

Total Cost Matrix by Team and Store

$$\begin{matrix} & Sports\ Home & Best\ Deals \\ Heat \\ Irish \\ Tigers \end{matrix}\begin{bmatrix} & \\ & \\ & \end{bmatrix}$$

2. Ally is eager to make sure that she is very clear on the different processes that she has learned recently about matrices. She is performing each of the operations for the matrix arithmetic below and then she is summarizing the processes. Find the matrix that is the result of each operation and then complete the summary with a clear explanation.

A.

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

When adding matrices….

B. $5 \times \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} =$

When performing scalar multiplication ….

C. $\begin{bmatrix} 45 \\ 67 \\ 34 \end{bmatrix} - \begin{bmatrix} 23 \\ 45 \\ 19 \end{bmatrix} =$

When subtracting matrices ….

D.
$\begin{bmatrix} 1 & -1 & 0 \\ 0 & 2 & -2 \\ -3 & 0 & 3 \end{bmatrix} \times \begin{bmatrix} 1 & 1 & 2 \\ 2 & 3 & 3 \\ 3 & 2 & 1 \end{bmatrix} =$

When multiplying matrices …

3. Austin and Ally are planning to do well in math class and so they are checking their understanding and working to do the following matrix arithmetic to make sure they have understood this matrix stuff properly. They wonder if the matrix operations they have learned can be performed on any matrices.
Help Austin and Ally do the matrix arithmetic below. If the operation cannot be completed say why it cannot be done.

A. $3 \times \begin{bmatrix} 1 \\ 2 \end{bmatrix} =$

B. $4 \begin{bmatrix} 4 \\ 5 \end{bmatrix} =$

C. $3 \times \begin{bmatrix} 1 \\ 2 \end{bmatrix} - 4 \begin{bmatrix} 4 \\ 5 \end{bmatrix} =$

D.
$\begin{bmatrix} 12 & 11 \end{bmatrix} - \begin{bmatrix} 4 \\ 7 \end{bmatrix} =$

E.
$\begin{bmatrix} 1 & 0 \\ -2 & 3 \end{bmatrix} + \begin{bmatrix} -1 & 1 \\ 3 & -4 \end{bmatrix} =$

F.
$\begin{bmatrix} -1 & 1 & 0 \\ 5 & 0 & -2 \\ 3 & 7 & 3 \end{bmatrix} \times \begin{bmatrix} 1 & 1 & 2 \\ 3 & 2 & 5 \end{bmatrix} =$

G.
$\begin{bmatrix} 9 & 2 \end{bmatrix} \begin{bmatrix} -3 \\ 4 \end{bmatrix} =$

H.
$\begin{bmatrix} 3 & 2 & 1 \\ -4 & 5 & 3 \end{bmatrix} \begin{bmatrix} 6 \\ 0 \end{bmatrix} =$

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