4.13B Matrices as Functions

AP Precalculus Name: _____ **CA #2**

Directions: Matrix A and B represent the transformations T and U respectively. Find the associated matrix for the composition of the function and then find the vector after the given transformation.

1) Find the associated matrix and $T\big(U(\vec{v})\big)$.

$A = \begin{bmatrix} -2 & -1 \\ 1 & 2 \end{bmatrix}, B = \begin{bmatrix} 1 & 3 \\ 2 & 3 \end{bmatrix}, \vec{v} = \langle 3,4 \rangle$

2) Find the associated matrix and $U\big(T(\vec{v})\big)$.

$A = \begin{bmatrix} -1 & -3 \\ 2 & -3 \end{bmatrix}, B = \begin{bmatrix} 2 & 3 \\ -2 & 3 \end{bmatrix}, \vec{v} = \langle 2,-5 \rangle$

3) Find the associated matrix and $U\big(T(\vec{v})\big)$.

$A = \begin{bmatrix} 3 & -1 \\ 3 & -2 \end{bmatrix}, B = \begin{bmatrix} -1 & -1 \\ 2 & 2 \end{bmatrix}, \vec{v} = \langle -1,-4 \rangle$

4) Find the associated matrix and $U\big(T(\vec{v})\big)$.

$A = \begin{bmatrix} 0 & -2 \\ 1 & 3 \end{bmatrix}, B = \begin{bmatrix} 0 & 1 \\ 3 & 2 \end{bmatrix}, \vec{v} = \langle 5,-3 \rangle$

Directions: Find the associated matrix to the composition of transformations.

5) Reflected in the x-axis and rotation of π radians counterclockwise.

6) Rotation of $\frac{\pi}{2}$ radians counterclockwise and horizontal dilation of 5.

Directions: Given $\vec{v}$ find the vector $\vec{u}$, that was transformed by matrix *A* to get $\vec{v}$.	
7) $\vec{v} = \langle 2,-8 \rangle$ and *A* = $\begin{bmatrix} -4 & 3 \\ 3 & -2 \end{bmatrix}$.	8) $\vec{v} = \langle -2,7 \rangle$ and *A* = $\begin{bmatrix} 10 & -4 \\ 3 & -1 \end{bmatrix}$.

ANSWERS

1) $\begin{bmatrix} -4 & -9 \\ 5 & 9 \end{bmatrix}, \langle -48,-51 \rangle$
2) $\begin{bmatrix} 4 & -15 \\ 8 & -3 \end{bmatrix}, \langle 83,31 \rangle$
3) $\begin{bmatrix} -6 & 3 \\ 12 & -6 \end{bmatrix}, \langle -6,12 \rangle$
4) $\begin{bmatrix} 1 & 3 \\ 2 & 0 \end{bmatrix}, \langle -4,10 \rangle$
5) $\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}$
6) $\begin{bmatrix} 0 & -5 \\ 1 & 0 \end{bmatrix}$
7) $\langle -24,-26 \rangle$
8) $\langle 15,38 \rangle$