

Problem 1. (1 point)

A mapping of vectors from \mathbb{R}^m to \mathbb{R}^n of the form $\vec{y} = A\vec{x}$, for some coefficient matrix A , is called a _____. (Note: enter the correct word or words; you want to use text mode to do this. Click the "Tt" button on the equation editor toolbar to the right before entering your answer.)

Answer(s) submitted:

- linear transformation

submitted: (correct)

recorded: (correct)

Problem 2. (1 point)

Suppose that we have a linear transformation T for which

$$T\left(\begin{bmatrix} 1 \\ 0 \end{bmatrix}\right) = \begin{bmatrix} 2 \\ 5 \end{bmatrix} \text{ and } T\left(\begin{bmatrix} 0 \\ 1 \end{bmatrix}\right) = \begin{bmatrix} 1 \\ -5 \end{bmatrix}.$$

Then the matrix of T is $\begin{bmatrix} _ & _ \\ _ & _ \end{bmatrix}$, and $T\left(\begin{bmatrix} 2 \\ 3 \end{bmatrix}\right) = \begin{bmatrix} _ \\ _ \end{bmatrix}$.

Answer(s) submitted:

- $\begin{bmatrix} 2 & 1 \\ 5 & -5 \end{bmatrix}$
- $\begin{bmatrix} 7 \\ -5 \end{bmatrix}$

submitted: (correct)

recorded: (correct)

Problem 3. (1 point)

Suppose that we have a linear transformation T and two vectors \vec{v} and \vec{w} , for which

$$T(\vec{v}) = \begin{bmatrix} 1 \\ 3 \\ 2 \end{bmatrix} \text{ and } T(\vec{w}) = \begin{bmatrix} 4 \\ -3 \\ 1 \end{bmatrix}.$$

What is $T(4\vec{v} - 5\vec{w})$?

$$T(4\vec{v} - 5\vec{w}) = \begin{bmatrix} _ \\ _ \\ _ \end{bmatrix}.$$

Answer(s) submitted:

- $\begin{bmatrix} -16 \\ 27 \\ 3 \end{bmatrix}$

submitted: (correct)

recorded: (correct)