

Math 4133 - Linear Algebra

Quiz #16 - 2013.03.04

Solutions

Determine which of the following are linear maps, and which are not. If a function is not a linear map, state your reasoning.

1. $T_1(\langle x, y, z \rangle) = x \langle 2, 3, 4, -1 \rangle + y \langle 2, 5, 0, -2 \rangle + z \langle 2, 8, 0, 2 \rangle$

T_1 is a linear map.

2. $T_2(\langle x, y \rangle) = \begin{bmatrix} 1 & 0 & -3 & 2 \\ 4 & -1 & 2 & 3 \end{bmatrix} \begin{bmatrix} 2 & 0 \\ 0 & 1 \\ 3 & 5 \\ 3 & 2 \end{bmatrix} \langle x, y \rangle$

T_2 is a linear map.

3. $T_3(\langle w, x, y, z \rangle) = \langle w - 2x + y, 2w + 3y - 4z, x - z \rangle$

T_3 is a linear map.

4. $T_4(\langle x, y \rangle) = \langle x, y, x, y, x, y, x, y \rangle$

T_4 is a linear map.