

MATH 441 CRN 33477 Quiz 3

May 11th, 2018

- (1) Suppose $T \in \mathcal{L}(\mathbb{F}^3, \mathbb{F}^2)$ is defined by $T(x, y, z) = (x - y - 3z, 2y + 5z)$. Find the matrix of T with respect to the standard bases of \mathbb{F}^3 and \mathbb{F}^2 .

$$\begin{bmatrix} 1 & -1 & -3 \\ 0 & 2 & 5 \end{bmatrix}.$$

- (2) Give an example of two linear maps S and T from \mathbb{R}^2 to \mathbb{R}^2 such that neither of S and T is an isomorphism but $S + T$ is an isomorphism.

$$S(x, y) = (x, 0).$$

$$T(x, y) = (0, y).$$

Neither of S and T is injective.

However, $S + T = I$.