

Math 411 Spring 2016 Homework #7

Due March 22, Tue in class

1. Textbook, 3.B, page 67: 6, 9, 13;
2. Let $T : \mathbb{R}^3 \rightarrow \mathbb{R}^3$ be $T((x_1, x_2, x_3)) = (x_2, x_3, x_1), \forall x = (x_1, x_2, x_3) \in \mathbb{R}^3$.
 - (1) Show that T is a linear map.
 - (2) Let W be a subspace of \mathbb{R}^3 , and $S = \{(x_2, x_3, x_1) : (x_1, x_2, x_3) \in W\}$. Show that S is a subspace of \mathbb{R}^3 using T . (*Hint:* How are S and the range of $T : W \rightarrow \mathbb{R}^3$ related?)
3. Let $T : V \rightarrow W$ be a surjective linear map, and $\{v_1, \dots, v_n\}$ spans the vector space V . Show that $\{T(v_1), \dots, T(v_n)\}$ spans the vector space W .

More practice problems: *Do not submit*

1. Textbook, 3.B, page 67: 10, 12, 15;
2. Let $T : V \rightarrow W$ and $S : W \rightarrow U$ be linear maps. Show that the composition $S \circ T : V \rightarrow U$ is a linear map.