


Feb 10 Lec 1 Notes

Theorem:

Let $T: V \rightarrow W$ and $S: W \rightarrow L$ be L.T.'s.

Then $S \circ T: V \rightarrow L$ is also a L.T.

Proof:

Let \vec{v}, \vec{w} , be V and r in \mathbb{R} .

$$\text{WTS } S \circ T(\vec{v} + r\vec{w}) = S \circ T(\vec{v}) + r S \circ T(\vec{w})$$

Then:

$$\begin{aligned} S \circ T(\vec{v} + r\vec{w}) &= S(T(\vec{v} + r\vec{w})) && \text{By def of composition of functions} \\ &= S(T(\vec{v}) + T(r\vec{w})) && \text{Since } T \text{ is a L.T.} \\ &= S(T(\vec{v}) + rT(\vec{w})) \end{aligned}$$