

Understanding the concept of field map..

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Hi everyone,

I was looking at the following article on Wikipedia:

http://en.wikipedia.org/wiki/Linear_map

In the following statement:

"Let V and W be vector spaces over the same field K . A function $f : V \rightarrow W$ is said to be a linear map if for any two vectors x and y in V and any scalar a in K , the following two conditions are satisfied:"

So, V and W define a Euclidean set of numbers, right? Now what do they exactly mean when it says they are over the same field or for that matter what would it mean when they are over a different field?

Also, I am a bit unsure about the terminology here:

When they say, the dot or inner product is a map from $\mathbb{R}(n) \times \mathbb{R}(n) \rightarrow \mathbb{R}$

Are they talking about the same map or are they saying that it is a transformation.

Also, in the above statement are we going from $\mathbb{R}(n)$ set of n tuples to \mathbb{R} (set of all reals)?

Sorry for these newbie questions....

Cheers,
Anja

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