Last name _____

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LARSON—MATH 310–CLASSROOM WORKSHEET 03
Linear Spaces (Vector Spaces).

From Chp. 2 of Tsukada, et al., Linear Algebra with Python

Review: $\mathbb{R}$, *field, complex numbers*, $\mathbb{R}^2$, $\mathbb{K}$, $\mathbb{K}^n$.

1. What is a *linear space* (or *vector space*) over a field $\mathbb{K}$?

2. Argue that $\mathbb{K}^n$ is a vector space.

3. What is a *subspace* of a vector space?

4. What is an example?

5. How are the continuous functions $f : \mathbb{R} \to \mathbb{R}$ on the interval $[0, 1]$ ($\mathbb{R}^{[0,1]}$) a linear space?

6. What is a *linear map* (or *linear transformation*) $f : V \to W$, from linear space V to linear space W?

7. What is an example?

8. What is the *kernel* of a linear transformation?

9. What is the *range* of a linear transformation?