

1.1 M. Axler: Dual Space and Dual Map

Definition:

A linear functional on V is a linear map from V to F . In other words, a linear functional is an element of $\mathcal{L}(V, F)$.

Definition:

The dual space of V , denoted by V' , is the vector space of all linear functionals on V . In other words, $V' = \mathcal{L}(V, F)$.

Lemma:

Suppose V is finite-dimensional. Then V' is also finite-dimensional and

$$\dim V' = \dim V.$$

$$\dim V' = \dim \mathcal{L}(V, F) = (\dim V) \cdot (\dim F) = \dim V.$$

Recommended Reading

- **Linear Functional Analysis** by Alt Nuernberg (Match: 0.69)
- **Linear Algebra Done Right** by Sheldon Axler (Match: 0.69)
- **Lineare Algebra 1** by Menny-Akka (Match: 0.69)