1 | **Axler6.39 linear functional**   **def**

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

2 | **results**

2.1 | **Axler6.42 Riesz Representation Theorem**

Any map defined by $u \in V$ that sends each $v \in V$ to $\langle u, v \rangle$ is a linear functional. This result says that every linear functional is such a map.

Suppose V is finite-dimensional and φ is a linear functional on V. Then there is a unique vector $u \in V$ s.t.
$$\varphi(v) = \langle v, u \rangle$$
For every $v \in V$.

Any map from an n-dimensional space to a 1-dimensional space is just a $1 \times n$ matrix, which is really just a linear combination.