

## 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  $\varphi$  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  $v \in V$ .