

**Source:**

## 1 | **Axler3.6 sum** $(S + T)$

If  $S, T \in \mathcal{L}(V, W)$  then the *sum*  $S + T$  is defined by

$$(S + T)(v) = Sv + Tv$$

$(S + T)$  is a linear map.

## 2 | **Axler3.6 scalar product** $\lambda T$

If  $T \in \mathcal{L}(V, W)$  and  $\lambda \in \mathbb{F}$  then the *product*  $(\lambda T)v = \lambda Tv$ .  $\lambda T$  is a linear map.

## 3 | **Axler3.8 Product of Linear Maps**

It's basically the composition of linear maps. Let  $U, V, W$  be vector spaces over  $\mathbb{F}$  and  $T, S$  be linear maps s.t.  $T \in \mathcal{L}(U, V)$  and  $S \in \mathcal{L}(V, W)$ .

## 4 | **Results**

### 4.1 | **Axler3.7** $\mathcal{L}(V, W)$ is a vector space over $\mathbb{F}$