

$$\underline{a \in \mathbb{F}, v \in V, av = 0 \Rightarrow a = 0 \text{ or } v = 0.}$$

Suppose $a \neq 0$. $a \in \mathbb{F} \Rightarrow \exists a^{-1} \in \mathbb{F}$ s.t. $aa^{-1} = 1$
(multiplicative inverse)

$$av = 0 \quad | \cdot a^{-1}$$

$$(av)a^{-1} = 0 \cdot a^{-1}$$

$$(aa^{-1})v = 0$$

$$1 \cdot v = 0$$

$$\underline{v = 0}$$

So if $a \neq 0 \Rightarrow v = 0$

□