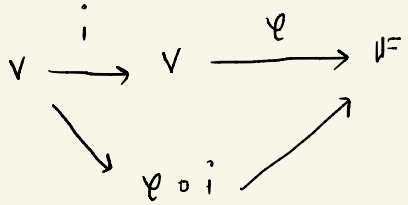
Proof

dual map of identity map on V: if $i \in \mathcal{L}(V, V)$, then the dual map of i is the linear map $i' \in \mathcal{L}(V', V')$ defined by $i'(\varphi) = \varphi \circ i$ for $\varphi \in V'$ (by definition)



For any $\varphi \in V' = \mathcal{L}(V, \mathbb{F})$, $i'(\varphi) = \varphi \circ i$

$= \varphi$