show injectivity

- Let $f(T) = T' = 0$ for any $T \in \mathcal{L}(V, W)$
- By 3.15, $T = 0$ ✓

show surjectivity

- By 3.61, $\dim \mathcal{L}(V, W) = (\dim V)(\dim W)$
- Similarly, $\dim \mathcal{L}(W', V') = \dim(W') \dim(V')$

$= (\dim W)(\dim V)$ by 3.94 ✓