c) version 2.

$$\boxed{\{T \in \mathcal{L}(V,W) : Tu = 0 \text{ for every } u \in U\} \subseteq \operatorname{range} \Gamma}$$

- let $T \in \{T \in \mathcal{L}(V,W) : Tu = 0 \text{ for every } u \in U\}$.

want to show $T \in \operatorname{range} \Gamma$ ie there exists $S \in \mathcal{L}(V/U, W)$ s.t $\Gamma(S) = S \circ \pi = T$.

$\Gamma : \mathcal{L}(V/U, W) \to \mathcal{L}(V,W)$ by $\Gamma(S) = S \circ \pi$.

- By 3E18 we know that given any $T \in \mathcal{L}(V,W)$, $T(u) = 0$ for all $u \in U$, there exist S such that $S \circ \pi = y$.

- Thus $y \in \operatorname{range} \Gamma$,

$$\boxed{\operatorname{range} \Gamma \subseteq \{T \in \mathcal{L}(V,W) : Tu = 0 \text{ for every } u \in U\}}$$

- given $T \in \operatorname{range} \Gamma$, $T = S \circ \pi$ we want to show $T \in \mathcal{L}(V,W)$ (true by definition) and $Tu = 0$ for every $u \in U$. This is true by 3E18, as such T exists iff $U \subseteq \operatorname{null} T$