Conversely, let $f \in W_1^\circ \cap W_2^\circ \Rightarrow f(a) = f(b) = 0, \ \forall\ a \in W_1, b \in W_2$.
$f(a'+b') = f(a') + f(b') = 0 + 0 = 0, \ \forall\ a'+b' \in W_1 + W_2$.
So $W_1^\circ \cap W_2^\circ \subset (W_1 + W_2)^\circ$.

$\boxed{2.6.15}$ $T: V \to W$ linear $\Rightarrow N(T^t) = [R(T)]^\circ$.

$$N(T^t) = \{g \in W^* \mid T^t(g) = T_0\} = \{g \in W^* \mid gT = T_0\} =$$
$$= \{g \in W^* \mid (gT)(x) = 0, \forall x \in V\}.$$
$$= \{g \in W^* \mid g(w) = 0, \ \forall\ w = T(x)\}.$$
$$= \{g \in W^* \mid g(w) = 0, \ \forall\ w \in R(T)\} =$$
$$= [R(T)]^\circ \text{ by definition.}$$

$\boxed{2.6.20}$ (finite-diml. case) $T: V \to W$ linear.

(a) T onto $\Leftrightarrow T^t$ is one-to-one

"$\Rightarrow$" T onto $\Rightarrow R(T) = W$.
$\Rightarrow (R(T))^\circ = \{f \in W^* \mid f(x) = 0, \ \forall\ x \in R(T) = W\} = \{0\}$.
$\Rightarrow$ from (15) above, $(R(T))^\circ = N(T^t) = \{0\} \Rightarrow$ T^t is one-to-one.

"$\Leftarrow$" T^t one-to-one $\Rightarrow N(T^t) = \{0\}$.
$\Rightarrow$ from (15), $[R(T)]^\circ = \{0\}$ also.

$R(T) \subset W$ subspace
$\Rightarrow \dim(R(T)) + \underbrace{\dim(R(T))^\circ}_{= 0} = \dim W \Rightarrow \dim(R(T)) = \dim W$

By previous homework problem, this implies $R(T) = W$
$\Rightarrow$ T is onto

(b) T^t onto $\Leftrightarrow T$ is one-to-one.
First note that $N(T) = \{0\} \Leftrightarrow N((T^t)^t) = \{0\}$.
This is easy to prove if you understood Thm. 2.26.