

Lemma 1. *If $\tau_1 \& \tau_2 <: \tau_3$ and $\cdot \vdash \tau_1 \& \tau_2$, then it is not possible that $\tau_1 <: \tau_3$ and $\tau_2 <: \tau_3$.*

Lemma 2. *If $\cdot \vdash e : \tau \hookrightarrow E$, then $e \Downarrow v$, and $E \Downarrow V$ where $|v| \Downarrow V$.*