## Axioms

(A1) $(\phi \to \psi) \to ((\psi \to \chi) \to (\phi \to \chi))$

(A2) $(\phi \& \psi) \to \phi$

(A3) $(\phi \& \psi) \to (\psi \& \phi)$

(A4) $(\phi \& (\phi \to \psi)) \to (\psi \& (\psi \to \phi))$

(A5) $(\phi \to (\psi \to \chi)) \to ((\phi \& \psi) \to \chi)$

(A6) $((\phi \& \psi) \to \chi) \to (\phi \to (\psi \to \chi))$

(A7) $((\phi \to \psi) \to \chi) \to (((\psi \to \phi) \to \chi) \to \chi)$

(A8) $\mathbf{0} \to \phi$

## Implication

(1) $\rho \to (\sigma \to \rho)$

(2) $(\rho \to (\sigma \to \tau)) \to (\sigma \to (\rho \to \tau))$

(3) $\rho \to \rho$

## Strong Conjunction

(4) $(\rho \& (\rho \to \sigma)) \to \sigma$

(5) $\rho \to (\sigma \to (\rho \& \sigma))$

(6) $(\rho \to \sigma) \to ((\rho \& \tau) \to (\sigma \& \tau))$

(7) $(\rho \to \sigma) \& (\tau \to \upsilon) \to ((\rho \& \tau) \to (\sigma \& \upsilon))$

## Weak Conjunction

(8) $(\rho \& \sigma) \to (\rho \wedge \sigma)$

(9) $((\rho \to \sigma) \wedge (\rho \to \tau)) \to (\rho \to (\sigma \wedge \tau))$

## Negation

(10) $\rho \to \neg\neg\rho,$

(11) $(\rho \& \neg\rho) \to \mathbf{0}.$

(12) $\rho \to (\neg\rho \to \sigma)$

(13) $(\rho \to (\sigma \& \neg\sigma)) \to \neg\rho$