From the lectures:

$$\phi \underset{int}{\models} \psi \quad \Longleftrightarrow \quad \underset{int}{\models} \phi \to \psi$$

$$\phi \underset{int}{\models} \psi, \sim\psi \quad \Longleftrightarrow \quad \underset{int}{\models} \sim\phi$$

Decide whether the following statements hold.

1. $\sim\alpha \to \beta, \sim\alpha \to \sim\beta \underset{int}{\models} \alpha$
2. $\sim\alpha \to \beta, \sim\alpha \to \sim\beta \underset{int}{\models} \sim\sim\alpha$
3. $\alpha \to \beta, \alpha \to \gamma \underset{int}{\models} \alpha \to (\beta \wedge \gamma)$
4. $\alpha \to \gamma, \beta \to \gamma \underset{int}{\models} (\alpha \vee \beta) \to \gamma$
5. $\alpha \to \beta \underset{int}{\models} \sim(\alpha \wedge \sim\beta)$
6. $\sim(\alpha \wedge \sim\beta) \underset{int}{\models} \alpha \to \beta$
7. $\alpha \to (\alpha \to \beta) \underset{int}{\models} \alpha \to \beta$
8. $\alpha \to (\beta \to \gamma) \underset{int}{\models} \beta \to (\alpha \to \gamma)$
9. $\sim(\alpha \to \sim\beta) \underset{int}{\models} \alpha \wedge \beta$

1	0
$\alpha \wedge \beta$	
α	
β	

1	0
	$\alpha \wedge \beta$
#1:	α
#2:	β

1	0
$\alpha \vee \beta$	
#1: α	
#2: β	

1	0
	$\alpha \vee \beta$
	α
	β

1	0
$\alpha \to \beta$	
#1:	α
#2: β	

1	0
$\star$	$\alpha \to \beta$

↓ (introduce a new world)

1	0
α	β
$\star$	

1	0
$\sim\alpha$	
	α

1	0
$\star$	$\sim\alpha$

↓

1	0
α	
$\star$	