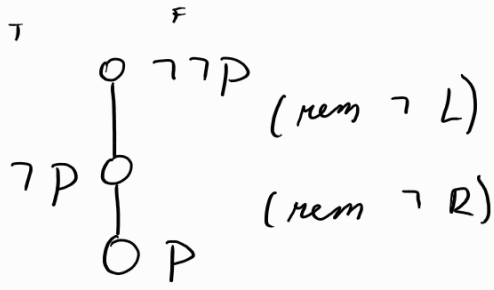
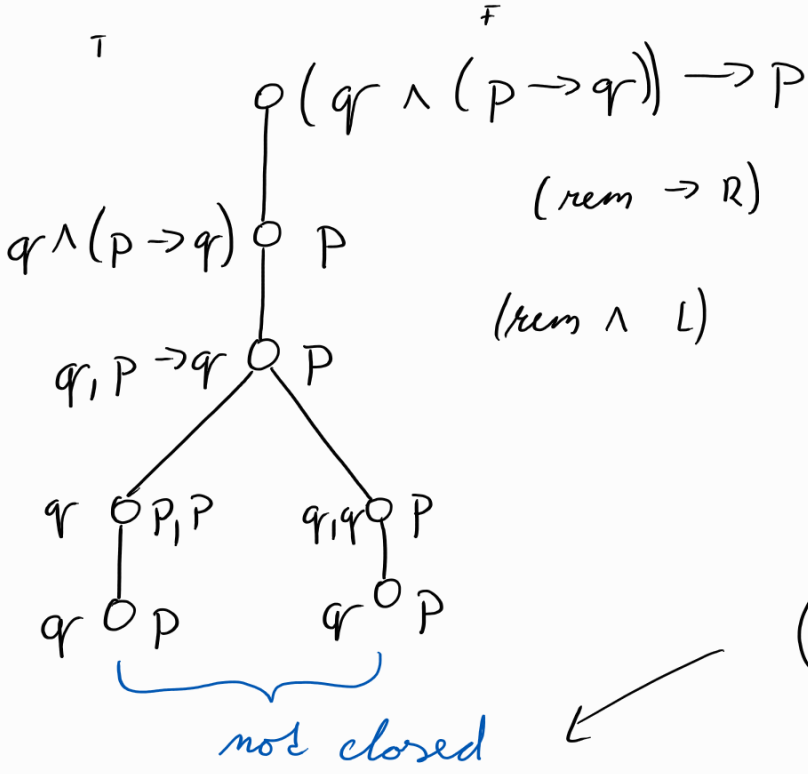


$\Rightarrow \neg\neg P$ not valid

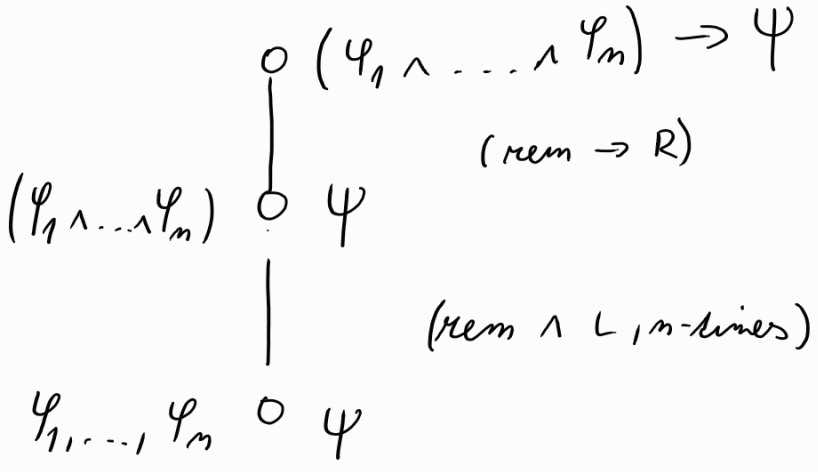


$(q \wedge (p \to q)) \to p$

not valid

2. $\dfrac{\varphi_1, \ldots, \varphi_n}{\psi}$ $\quad (\varphi_1 \wedge \ldots \wedge \varphi_n) \to \psi$

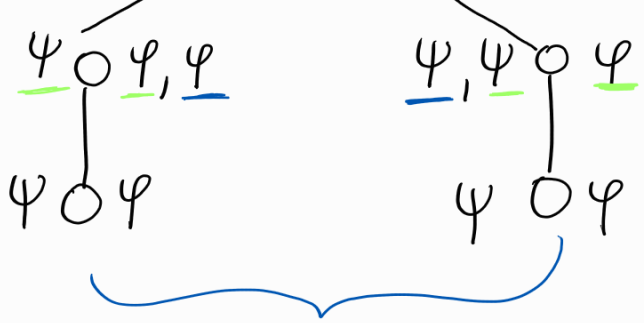
True = inference valid



$\varphi \to \psi$, $\psi \vdash \varphi$ valid?

$\varphi \to \psi, \psi \circ \varphi$

(rem → L)



open branches

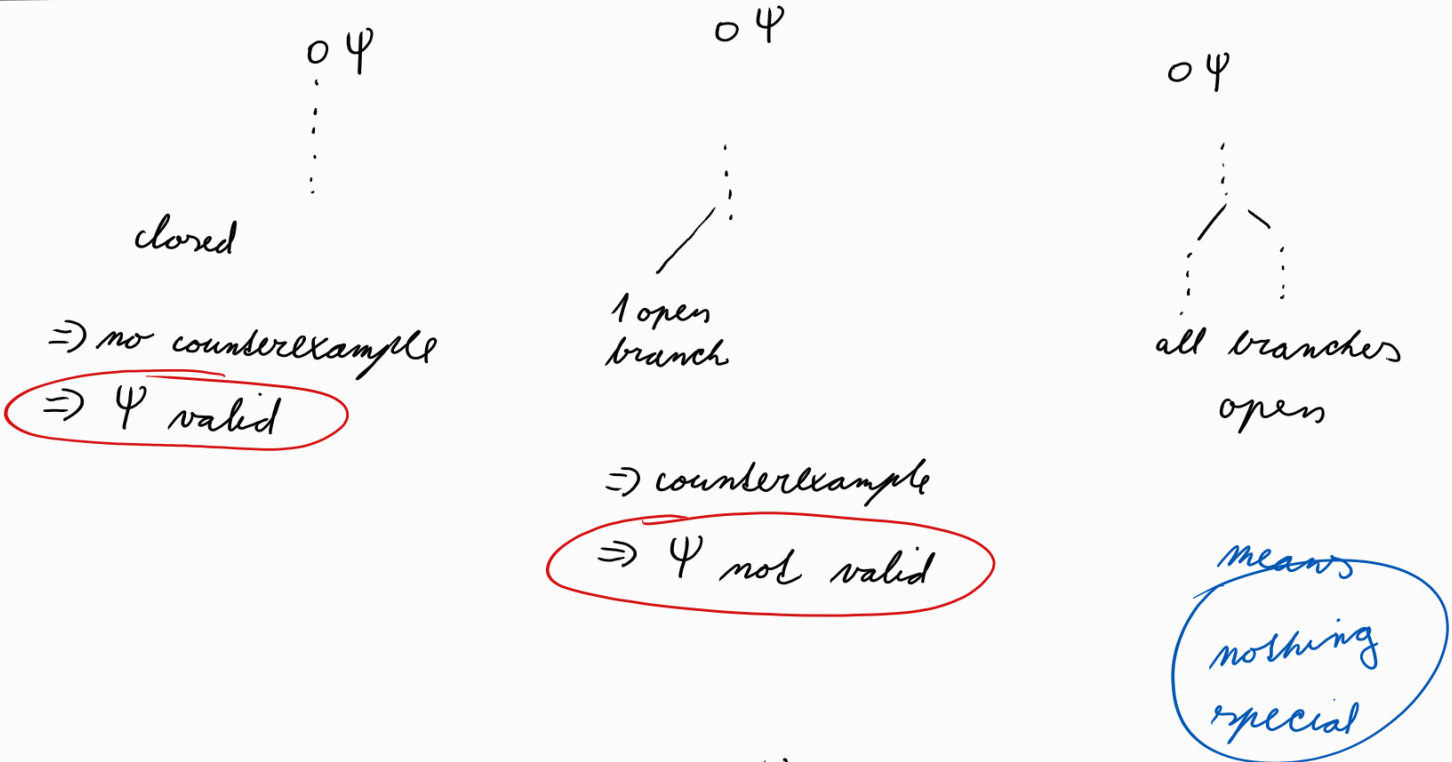
⇒ tableau not closed

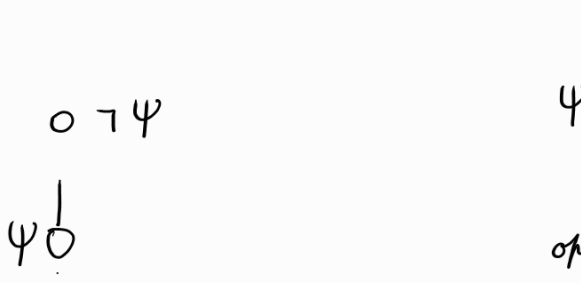
⇒ inference not valid!

so if ψ is true, φ false

$V(\psi) = 1$ $V(\varphi) = 0$, then

- $V(\varphi \to \psi) = 1$
- $V(\psi) = 1$
- $V(\varphi) = 0$





closed

$\Rightarrow \neg\Psi$ valid

$\Rightarrow \Psi$ never true (always false)

$\Rightarrow \Psi$ contradiction

($\neg\Psi$ is valid)

$\Rightarrow \neg\Psi$ not valid

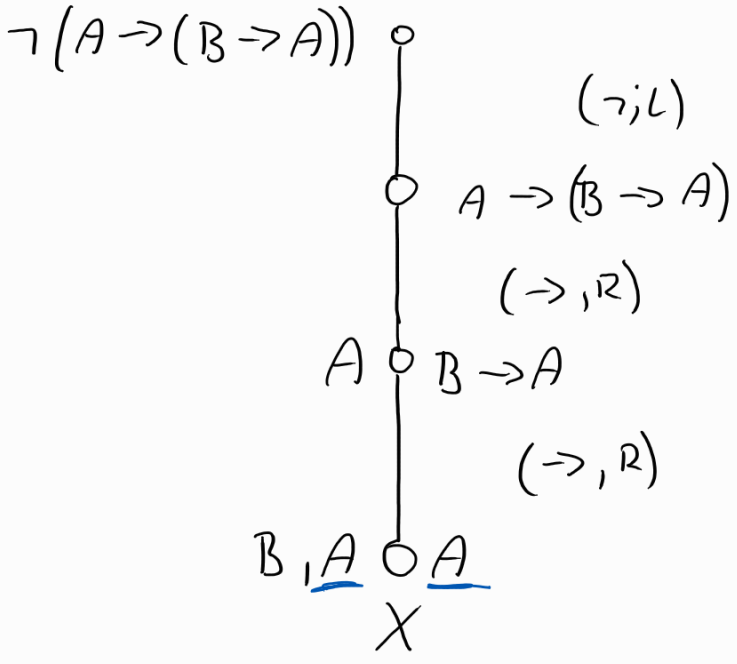
$\Rightarrow \neg\Psi$ not always true

$\Rightarrow \Psi$ not always false

$\Rightarrow \Psi$ satisfiable

---

check if $\neg(A \to (B \to A))$ is a contradiction



$\Rightarrow$ tableau closed

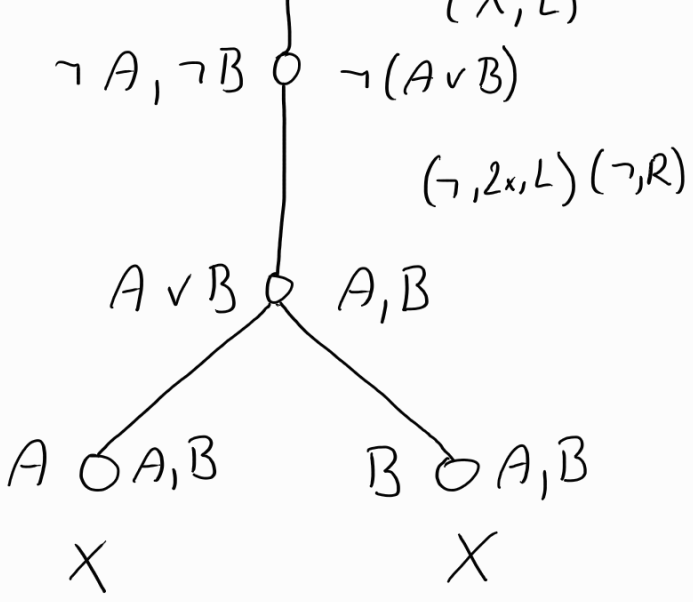
$\Rightarrow \neg(A \to (B \to A))$ is a contradiction

($\Rightarrow A \to (B \to A)$ is valid)

$\neg A \wedge \neg B \vDash \neg(A \vee B)$ is valid inference?

$\neg A \wedge \neg B$

$\neg(A \vee B)$



$\Rightarrow$ closed tableau $\Rightarrow$ valid ✓