

## tab.1 Tableaux for K

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sec

**Example tab.1.** We give a closed tableau that shows  $\vdash (\Box\varphi \wedge \Box\psi) \rightarrow \Box(\varphi \wedge \psi)$ .

1.	$1 \text{ F } (\Box\varphi \wedge \Box\psi) \rightarrow \Box(\varphi \wedge \psi)$	Assumption
2.	$1 \text{ T } \Box\varphi \wedge \Box\psi$	$\rightarrow \text{T } 1$
3.	$1 \text{ F } \Box(\varphi \wedge \psi)$	$\rightarrow \text{T } 1$
4.	$1 \text{ T } \Box\varphi$	$\wedge \text{T } 2$
5.	$1 \text{ T } \Box\psi$	$\wedge \text{T } 2$
6.	$1.1 \text{ F } \varphi \wedge \psi$	$\Box \text{F } 3$
$\swarrow \quad \searrow$		
7.	$1.1 \text{ F } \varphi$	$1.1 \text{ F } \psi$
8.	$1.1 \text{ T } \varphi$	$1.1 \text{ T } \psi$
	$\otimes$	$\otimes$
		$\wedge \text{F } 6$ $\Box \text{T } 4; \Box \text{T } 5$

**Example tab.2.** We give a closed tableau that shows  $\vdash \Diamond(\varphi \vee \psi) \rightarrow (\Diamond\varphi \vee \Diamond\psi)$ :

1.	$1 \text{ F } \Diamond(\varphi \vee \psi) \rightarrow (\Diamond\varphi \vee \Diamond\psi)$	Assumption
2.	$1 \text{ T } \Diamond(\varphi \vee \psi)$	$\rightarrow \text{T } 1$
3.	$1 \text{ F } \Diamond\varphi \vee \Diamond\psi$	$\rightarrow \text{T } 1$
4.	$1 \text{ F } \Diamond\varphi$	$\vee \text{F } 3$
5.	$1 \text{ F } \Diamond\psi$	$\vee \text{F } 3$
6.	$1.1 \text{ T } \varphi \vee \psi$	$\Diamond \text{T } 2$
$\swarrow \quad \searrow$		
7.	$1.1 \text{ T } \varphi$	$1.1 \text{ T } \psi$
8.	$1.1 \text{ F } \varphi$	$1.1 \text{ F } \psi$
	$\otimes$	$\otimes$
		$\vee \text{T } 6$ $\Diamond \text{F } 4; \Diamond \text{F } 5$

**Problem tab.1.** Find closed **tableaux** in **K** for the following **formulas**:

1.  $\Box\neg p \rightarrow \Box(p \rightarrow q)$
2.  $(\Box p \vee \Box q) \rightarrow \Box(p \vee q)$
3.  $\Diamond p \rightarrow \Diamond(p \vee q)$

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## Bibliography