

tab.1 Tableaux for K

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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.	$1 \text{ T } \Box\varphi \wedge \Box\psi$	$\rightarrow \text{F } 1$
3.	$1 \text{ F } \Box(\varphi \wedge \psi)$	$\rightarrow \text{F } 1$
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		
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.	$1 \text{ T } \Diamond(\varphi \vee \psi)$	$\rightarrow \text{F } 1$
3.	$1 \text{ F } \Diamond\varphi \vee \Diamond\psi$	$\rightarrow \text{F } 1$
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		
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. $\Diamond p \rightarrow \Diamond(p \vee q)$
4. $\Box(p \wedge q) \rightarrow \Box p$

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Bibliography