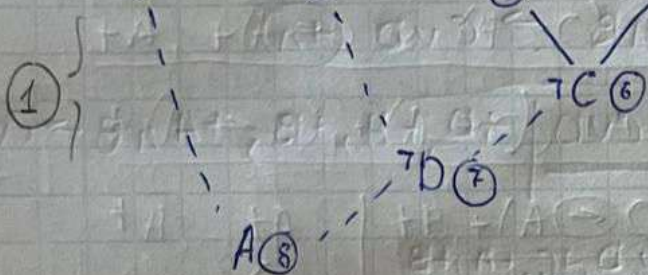


$$1. \{A \vee D, D \rightarrow C, \neg A \vee \neg C\} \vdash \neg A \vee B$$

Перевіримо, чи суперлишда:

$$\{A \vee B, \neg D \vee C, \neg A \vee \neg C, A, \neg B\}$$



Множина не суперлишда
 \Rightarrow верно

Контрприклад:
 $\mathcal{I}(A) = T$
 $\mathcal{I}(B) = F$
 $\mathcal{I}(C) = F$
 $\mathcal{I}(D) = F$

$$2. \vdash A \rightarrow (\neg A \rightarrow B)$$

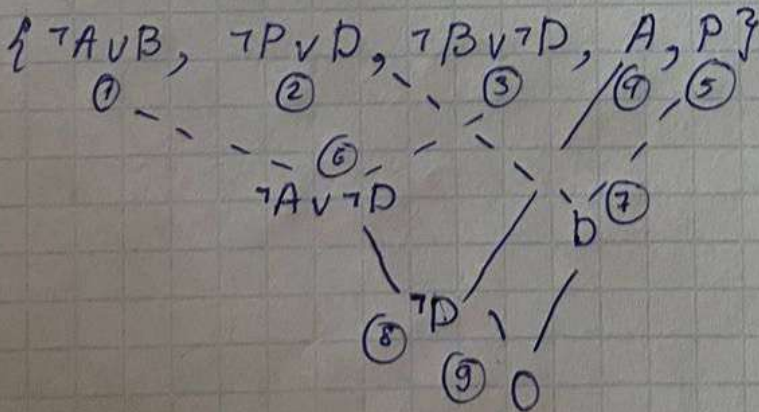
через \neg, \vee : $\vdash \neg A \vee (A \vee B)$

$$\frac{}{Ax} \neg A \vee \neg A \quad \frac{}{Pk} \neg A \vee \neg A \quad \frac{}{Pl} B \vee (\neg A \vee \neg A) \quad \frac{}{Pn} (\neg A \vee \neg A) \vee B$$

$$\frac{}{Pa} \neg A \vee (\neg A \vee B)$$

$$3. \{A \rightarrow B, P \rightarrow D, \neg B \vee \neg D\} \vdash \neg A \vee \neg P$$

$$\neg A \vee B \quad \neg P \vee D$$



Множина суперлишда
 \Rightarrow верно.

4. $\vdash (A \vee C) \rightarrow B$, то $\vdash A \rightarrow B$

$\vdash (A \vee C) \rightarrow B, \vdash A \Rightarrow B \quad (\vdash \rightarrow)$

$\vdash A, \vdash C, \vdash (A \vee C) \Rightarrow B$

$\vdash A \vee C, \vdash A, \vdash C \mid \vdash B, \vdash A, \vdash C$

$(\vdash \vee) \vdash A \vee C, \vdash A, \vdash C$

таблицы:
 $\mathcal{D}(A) = T$
 $\mathcal{D}(B) = T$
 $\mathcal{D}(C) = F$

дерево не замкнуто
 \Rightarrow неверно

$$5. (A \rightarrow B) \& (A \rightarrow C) \& (A \rightarrow D) \rightarrow \neg A$$

Big епротивного:

$$\frac{\vdash (A \rightarrow B) \& (A \rightarrow C) \& (A \rightarrow D) \rightarrow \neg A}{\vdash (A \rightarrow B) \& (A \rightarrow C) \& (A \rightarrow D), \vdash \neg A}$$

$$\frac{\vdash (A \rightarrow B) \& (A \rightarrow C) \& (A \rightarrow D), \vdash \neg A}{\vdash A, \vdash (A \rightarrow D) \& (A \rightarrow C) \& (A \rightarrow B), \vdash \neg A}$$

$$\frac{\vdash A, \vdash (A \rightarrow D) \& (A \rightarrow C) \& (A \rightarrow B), \vdash \neg A}{\vdash (A \rightarrow B), \vdash (A \rightarrow C), \vdash (A \rightarrow D), \vdash A}$$

$$\frac{\vdash (A \rightarrow B), \vdash (A \rightarrow C), \vdash (A \rightarrow D), \vdash A}{\vdash A, \vdash A \mid \vdash B, \vdash (A \rightarrow C), \vdash (A \rightarrow D), \vdash A}$$

$$\frac{\vdash A, \vdash A \mid \vdash B, \vdash (A \rightarrow C), \vdash (A \rightarrow D), \vdash A}{\vdash A, \vdash B, \vdash (A \rightarrow D), \vdash A \mid \vdash C, \vdash B, \vdash (A \rightarrow D), \vdash A}$$

$$\frac{\vdash A, \vdash B, \vdash (A \rightarrow D), \vdash A \mid \vdash C, \vdash B, \vdash (A \rightarrow D), \vdash A}{\vdash A, \vdash C, \vdash B, \vdash A \mid \vdash D, \vdash C, \vdash B, \vdash A}$$

Выведение не истинно, заштрихованное выделено

Контрпример:

$$\mathcal{V}(A) = \text{true}$$

$$\mathcal{V}(B) = \text{true}$$

$$\mathcal{V}(C) = \text{true}$$

$$\mathcal{V}(D) = \text{true}$$