

Kontrolltöö 8.10.2012

Lahendused

1.

$$\begin{aligned}
 & \neg(((p \vee \neg q) \wedge r) \supset \neg s) \vee t \\
 \Leftrightarrow & (((p \vee \neg q) \wedge r) \wedge \neg \neg s) \vee t \\
 \Leftrightarrow & ((p \vee \neg q) \wedge r \wedge s) \vee t \\
 \Leftrightarrow & (p \vee \neg q \vee t) \wedge (r \vee t) \wedge (s \vee t)
 \end{aligned}$$

2. Täielik disjunktivne normaalkuju vahetult tõeväärtustabelist:

$$(\neg p \wedge \neg q \wedge \neg r) \vee (\neg p \wedge \neg q \wedge r) \vee (p \wedge \neg q \wedge \neg r) \vee (p \wedge q \wedge r)$$

Väiksem:

$$(\neg p \wedge \neg q) \vee (\neg q \wedge \neg r) \vee (p \wedge q \wedge r)$$

3.

$$\begin{array}{c}
 \frac{\frac{p \vee q \supset r \quad \frac{q}{p \vee q} \vee \mathcal{I}_R}{r} \supset \mathcal{E}}{\frac{r \vee s \vee \mathcal{I}_L}{q \supset r \vee s} \supset \mathcal{I}, -2} \supset \mathcal{I}, -1 \\
 \frac{}{(p \vee q \supset r) \supset (q \supset r \vee s)} \supset \mathcal{I}, -1
 \end{array}$$

$$\begin{array}{c}
 \frac{\frac{q \rightarrow p, q, r, s \text{ hyp.}}{q \rightarrow p \vee q, r, s} \vee \mathcal{R} \quad \frac{r, q \rightarrow r, s \text{ hyp.}}{} \supset \mathcal{L}}{\frac{p \vee q \supset r, q \rightarrow r, s}{p \vee q \supset r, q \rightarrow r \vee s} \vee \mathcal{R}} \supset \mathcal{R} \\
 \frac{}{\rightarrow (p \vee q \supset r) \supset (q \supset r \vee s)} \supset \mathcal{R}
 \end{array}$$

$$\begin{array}{c}
 \frac{\frac{\frac{}{\neg(p \supset q)} \supset \mathcal{I}, -3}{\frac{q}{p \supset q} \supset \mathcal{I}, -3}}{\frac{}{\neg q} \neg \mathcal{E}} \supset \mathcal{I}, -2} \supset \mathcal{I}, -1 \\
 \frac{}{\neg(p \supset q) \supset \neg q} \supset \mathcal{I}, -1
 \end{array}$$

$$\begin{array}{c}
 \frac{\frac{p, q \rightarrow q \text{ hyp.}}{\rightarrow p \supset q, \neg q} \neg \mathcal{R}}{\frac{}{\neg(p \supset q) \rightarrow \neg q} \neg \mathcal{L}} \supset \mathcal{R} \\
 \frac{}{\rightarrow \neg(p \supset q) \supset \neg q} \supset \mathcal{R}
 \end{array}$$