Advanced Topics in Computational Complexity

Exercise Session 9

Due 14.12.2015.

Exercise 1

Prove case 1 of Lemma 8 from the lecture notes.

Exercise 2

Prove cases $\neg p$ and $\varnothing$ of Theorem 17 from the lecture notes.

Exercise 3

Let $K = (W, R, V)$ be a Kripke model such that $W = \{1, 2, 3, 4\}$, $R = \{(1, 1), (1, 3), (2, 1), (3, 2)\}$, $V(p) = \{1, 2\}$, and $V(q) = \{1, 3\}$. Let $\Psi = \{p, \Diamond p, \Box(p \vee q), \Diamond q \vee q\}$.

Compute $\mathrm{tp}_{\Psi}(K, 3)$, $\mathrm{TP}_{\Psi}(K, \{1, 2\})$ and $\mathrm{TP}_{\Psi}(K, \{1, 2, 4\})$. Does $K, \{1, 2, 4\} \models \xi_{K,\{1,2\}}$ or $K, \{1, 2\} \models \xi_{K,\{1,2,4\}}$ hold? The formula $\xi_{K,T}$ is defined in Lemma 9. Compute the defining formula $\theta_{\mathrm{tp}_{\Psi}(K,3)}$ of $\mathrm{tp}_{\Psi}(K, 3)$.