Logic Seminar 2015 Autumn

Homework 2

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1 Consider the following inference:

- $p \to q$
- $\neg r \to \neg q$
- $r \to \neg s$
- $\underline{\neg s \to t}$
- $\therefore\ \neg t \to \neg p$

Give an ordinary language argument of this form. Check by means of indirect argument whether or not it is valid.

2 Consider the following inference:

- $(p \vee q) \to \neg r$
- $\underline{p \leftrightarrow \neg q}$
- $\neg r$

Give an ordinary language argument of this form. Check with the analytic tableaux method whether or not it is valid.

3 Check the following logical equivalences by means of truth tables:

(a) $\neg(p \wedge \neg q) \iff^{?} \neg p \vee q$

(b) $p \to q \iff^{?} \neg(\neg p \wedge q)$

(c) $p \vee (q \wedge r) \iff^{?} (p \vee q) \wedge (p \vee r)$