

**COMP 681 Formal Methods****Spring 2009****Assignment 2**

**1** (6 pts.). Use the shorter truth table method to show that the following are tautologies.

**a** (3 pts.).  $p \Rightarrow q \wedge r \Rightarrow (p \Rightarrow q) \wedge (p \wedge q \Rightarrow r)$

**b** (3 pts.).  $\neg p \wedge (q \Rightarrow r) \vee \neg r \Leftrightarrow p \Rightarrow \neg r$

**2** (6 pts.). Use transformational proof to prove the following.

**a** (3 pts.).  $p \wedge \neg q \vee q \langle \equiv \rangle p \vee q$

**b** (3 pts.).  $(p \vee q) \wedge (p \Rightarrow q) \wedge (q \Rightarrow r) \langle \equiv \rangle (p \vee q) \wedge r$