Logic for Computer Science - Week 7 - Exercise Sheet

1. Compute a CNF for the formula $\mathtt{p} \vee \mathtt{q} \to \mathtt{p} \wedge \neg \mathtt{r}$ using Tseitin's transformation.

2. Using resolution with Tseitin's algorithm, show that the following formulae are valid:

   (a) $\mathtt{p} \wedge \mathtt{q} \to \mathtt{p} \vee \mathtt{q}$;

   (b) $\mathtt{p} \to (\mathtt{q} \to \mathtt{p})$;

   (c) $(\mathtt{p} \to \mathtt{q}) \to (\neg \mathtt{q} \to \neg \mathtt{p})$;

3. Using resolution with Tseitin's algoritm, prove that the following logical consequences hold:

   (a) $p \models p \vee q$;

   (b) $p \wedge q \models p \vee q$;

   (c) $p \wedge q \to r \models p \to (q \to r)$;

   (d) $p \to p', q \to q' \models (p \wedge q) \to (p' \vee q')$.