CSci 1302 Assignment 3

Due Wedn., Sept. 20 in class

Problem 1 (6 points). Exercises 10, 11, 12 p. 41.

Problem 2 (6 points). Exercises 42, 44 p. 43.

Problem 3 (20 points). Prove the following using deductive proofs (not truth tables).

1. $(p \vee q) \rightarrow r$
   $\therefore \sim r \rightarrow \sim p$
2. $\sim (p \rightarrow q)$
   $p \rightarrow r$
   $\therefore r$
3. $p \wedge \sim r$ (use proof by contradiction)
   $q \rightarrow r$
   $\therefore \sim (p \rightarrow q)$
4. $(p \wedge q) \leftrightarrow r$
   $\therefore (r \rightarrow p) \wedge (r \rightarrow q)$
5. $(p \vee q) \leftrightarrow r$
   $\therefore (p \rightarrow r) \wedge (q \rightarrow r)$

Problem 4 (6 points). Which of the following two arguments are valid (if any)? Justify your answer the following way: use deductive proofs or truth tables to prove a valid argument; show at least one row of the truth table to disprove an invalid argument.
You might want to guess the answer first, and then check your intuition.

A. $(p \vee q) \rightarrow s$
$(q \vee r) \rightarrow s$
$\therefore q \rightarrow s$

B. $(p \wedge q) \rightarrow s$
$(q \wedge r) \rightarrow s$
$\therefore q \rightarrow s$