Week #5 Exercises

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1. Show by truth table:
   1. $p,\ p \rightarrow q \models q$
   2. $(p \wedge q \equiv p) = (q \equiv p \vee q)$

2. Let $p \not\equiv q = \neg(p \equiv q)$
determine by Truth table whether
$p \wedge (q \not\equiv r) = (p \wedge q) \not\equiv (p \wedge r)$

Wk # 5 Exercises Cont'd

3. Determine by the method of Truth Table or by Refutation whether the following argument is valid.

If John has installed central heating then, either he has sold his car or he has borrowed money from the bank.
John has not borrowed money from the bank.
Therefore
if John has not sold his car then he has not installed central heating.

Abbreviations:
b : *John has borrowed money from the bank*
c : *John has installed central heating*
s : *John has sold his car.*