Assignment #5. Due Thurs March 3.

1. Use the (unsigned) tree method to determine whether the following arguments in **PLC** are tautologically valid. Make sure to explain your answers.

    (a) $((P \lor Q) \supset \neg R), (R \equiv \neg Q) \therefore (Q \supset P)$

    (b) $(P \supset R) \therefore ((P \land Q) \supset R)$

2. Determine if the following claims about **PLC** trees are true or false. Explain your answer.

    (a)   If there is a complete tree for the **PLC** *wff A* all of whose branches are open, then A is a tautology.

    (b)   If there is a complete tree for the **PLC** *wff A* all of whose branches close, then A is a contradiction.

    (c)   If there is a complete truth tree for the **PLC** *wff* $(A \supset B)$ all of whose branches are closed, then A is a tautology and B is a contradiction.

3. Prove the following: For any *wffs* $A_1, ..., A_n, C$, if $\vDash ((A_1 \land ... \land A_n) \supset C)$, then $A_1, ..., A_n \vDash C$.