

Assignment #4. Due Tues, Feb 25.

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

(a) $(\neg P \wedge Q) \therefore \neg(P \wedge Q)$

(b) $P, \neg P \therefore Q$

(c) $(Q \vee \neg P), \neg(Q \wedge \neg R), (\neg R \vee \neg P) \therefore \neg P$

(d) $(\neg(P \vee Q) \vee \neg R), (\neg R \vee \neg Q) \therefore (\neg Q \vee P)$

2. Recall that the corresponding conditional of an argument in **PL** is a conditional *wff* whose consequent is the conclusion and whose antecedent is the conjunction of all the premises. Determine whether the following arguments in **PL** are tautologically valid by evaluating their corresponding conditionals *using the tree method*.

(a) $(\neg P \wedge Q) \therefore \neg(P \wedge Q)$

(b) $P, \neg P \therefore Q$