

Assignment #2. Due Thus Feb 11.

1. For each of the pairs of *wffs* below, construct a truth table that includes them and indicate whether or not they are truth-functionally equivalent. Explain your answer by referring to your truth table.

- (a) $\neg(\neg P \wedge \neg P)$ P
(b) $((P \vee Q) \wedge R)$ $(P \vee (Q \wedge R))$
(c) $(P \vee \neg P)$ $\neg P$

2. Construct a *wff* in **PL** that is truth-functionally equivalent to the truth function $\#(P, Q, R)$ given by the following truth-table:

P	Q	R	$\#(P, Q, R)$
T	T	T	F
T	T	F	T
T	F	T	T
T	F	F	T
F	T	T	F
F	T	F	F
F	F	T	F
F	F	F	F

3. Use the truth table 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) $(Q \vee \neg P), \neg(Q \wedge \neg R), (\neg R \vee \neg P) \therefore \neg P$