Math 314 Summer 2011

6/2/2010
Quiz #2

Name: Key

Show all work clearly and in order. Please box your answers. 10 minutes.

1. Verify the following logical equivalence:

$$(p \wedge \neg q) \vee p \equiv p$$

p	q	$\neg q$	$p \wedge \neg q$	$(p \wedge \neg q) \vee p$
T	T	F	F	T
T	F	T	T	T
F	T	F	F	F
F	F	T	F	F

truth tables are the same. Hence, $(p \wedge \neg q) \vee p \equiv p$

(i.e., $((p \wedge \neg q) \vee p) \leftrightarrow p$ is a tautology)

2. Use truth tables to verify the validity of the following argument form:

$$p$$
$$p \rightarrow q$$
$$\neg q \vee r$$
$$\therefore r$$

p	q	r	$\neg q$	p	$p \rightarrow q$	$\neg q \vee r$	r
				premises			conclusion
T	T	T	F	T	T	T	T
T	T	F	F	T	T	F	F
T	F	T	T	T	F	T	T
T	F	F	T	T	F	T	F
F	T	T	F	F	T	T	T
F	T	F	F	F	T	F	F
F	F	T	T	F	T	T	T
F	F	F	T	F	T	T	F

← critical row (only one), and the conclusion is true.

Hence, the argument form is valid.