Math 112 - Quiz 6

October 4, 2017

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (3 points) Correct the truth table shown below.

p	q	$\sim q$	$(\sim q \vee p)$	$(\sim q \vee p) \rightarrow q$
T	T	F	(F) T	T
T	F	T	T	F
F	T	(T) F	F	T
F	F	T	T	(T) F

2. (2 points) In class, we showed that $\sim(p \rightarrow q)$ is logically equivalent to $\sim q \wedge p$. Use this to negate the statement, "If it is Friday, then I will not eat pizza."

p q

I WILL EAT PIZZA AND IT IS FRIDAY.

3. (3 points) Use a truth table to determine whether $(p \rightarrow q) \wedge (\sim p \vee q)$ is a tautology, a self-contradiction, or neither.

p	q	$p \rightarrow q$	$\sim p$	$\sim p \vee q$	$(p \rightarrow q) \wedge (\sim p \vee q)$
T	T	T	F	T	T
T	F	F	F	F	F

CAN STOP HERE.

IT IS NEITHER.

4. (1 point) How do we show that two compound statements are logically equivalent?

SHOW THAT THEY HAVE IDENTICAL TRUTH TABLES.

5. (1 point) What does it mean for a compound statement to be a tautology?

IT IS ALWAYS TRUE.