Math 102, Section 1
Quiz 2 Solutions
02/15/2007

Name:_____

1. (3 points) Identify the form of the following argument, and state whether the argument is valid:

   If I run away from home, then I will join the circus

   I joined the circus

   Therefore, I ran away from home

   Solution: If we take p : I run away from home, and q : I join the circus, then the form of the argument above is:

   $p \rightarrow q$

   q

   $\therefore p$

   This is the Fallacy of the Converse, so the argument is Invalid.

2. (5 points) Use a truth table to determine whether or not the following argument is valid:

   If I win the lottery, then I will quit my job.

   I did not quit my job

   Therefore, I did not win the lottery

   Solution: If we take p : I win the lottery, and q : I will quit my job, then the form of the argument above is:

   $p \rightarrow q$

   $\sim q$

   $\therefore \sim p$

   Thus, we can determine the validity of this argument by building the truth table for $(p \rightarrow q) \wedge (\sim q) \rightarrow (\sim p)$

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

3. (2 points) Draw an Euler diagram for the statements: "All A's are not B's", "Some C's are A's", and " All D's are B's"

   Solution: Notice that the first statement requires A and B to have nothing in common. The second requires A and C to meet, and the third requires B to contain all of D. One possible Euler diagram is as follows: