

LOGIC Assignment 4

Name _____

1 Logic, symbols and words

Given the statements

p : It is raining

q : I am wearing my coat

(a) Write down, in words, the meaning of $q \Rightarrow \neg p$

(b) Complete the truth table

p	q	$\neg p$	$q \Rightarrow \neg p$
T	T		
T	F		
F	T		
F	F		

(c) Write in symbols, the contrapositive of $q \Rightarrow \neg p$

2 3 propositions and truth tables

Considering the propositions, a , b and c and the compound statements

a : a person achieves grade 7 in Mathematics

b : a person achieves grade 7 in English

c : a person has above average IQ

(i) write the following statements in words

$$c \Rightarrow (a \vee b)$$

$$\neg(a \vee b) \Rightarrow \neg c$$

(ii) Construct a truth table to establish the truth values of both of these statements

a	b	c	$c \rightarrow (a \vee b)$	$\neg(a \vee b) \rightarrow \neg c$
T	T	T		
T	T	F		
T	F	T		
T	F	F		
F	T	T		
F	T	F		
F	F	T		
F	F	F		

3 Truth Tables and Contradiction

Show using truth tables that the following statement is a contradiction

$$\neg b \wedge [a \wedge (b \vee \neg a)]$$

4 Construct a truth table for $(\neg p \vee q) \leftrightarrow r$ and determine if the statement is a tautology, a contradiction or neither.

5 If I like Irish, then I like Logic. Write the converse, inverse, and contrapositive.