

QUIZ 1 FOR M325K

Name: _____
 UT EID: _____

(1) [2 points] Define *logical equivalence*

(2) [2 points] Give the *De Morgan's Laws*

(3) [4 points] Verify the logical equivalence

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

by completing the truth table below

p	q	r		
1	1	1		
1	1	0		
1	0	1		
1	0	0		
0	1	1		
0	1	0		
0	0	1		
0	0	0		

What is it about the truth table which shows the expressions are logically equivalent ?

(4) [2 points] Explain why this also proves

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