Math 174, Fall 2003, Solution to Quiz 1

Question: Are $(p \wedge q) \vee r$ and $p \wedge (q \vee r)$ logically equivalent? Justify your answer. (You will probably want to use a truth table or well known logical equivalences.)

Answer: Here is the truth table:

p	q	r	$(p \wedge q) \vee r$	$p \wedge (q \vee r)$	
T	T	T	T	T	
T	T	F	T	T	
T	F	T	T	T	
T	F	F	F	F	
F	T	T	T	F	★
F	T	F	F	F	
F	F	T	T	F	★
F	F	F	F	F	

The rows with ★ show that $(p \wedge q) \vee r$ and $p \wedge (q \vee r)$ are **NOT** logically equivalent.