

Solution: Quiz 1

1. Determine whether the following argument form is valid or not by using the truth table.

If I do not read text books, then I come to class or I do not pass the class.

If I come to class, then pass the class.

I read text books or I come to class.

Therefore, I pass the class.

Answer:

(b) Invalid.

Let p be “I do not read text books”; q be “I come to class,” and r be “I do not pass the class.”

If I do not read text books, then I come to class or I do not pass the class. $p \rightarrow q \vee r$

If I come to class, then pass the class. $q \rightarrow \sim r$

I read text books or I come to class. $\sim p \vee q$

\therefore I pass the class. $\therefore \sim r$

Truth table:

Premises					Conclusion				
p	q	r	$\sim r$	$q \vee r$	$p \rightarrow q \vee r$	$q \rightarrow \sim r$	$\sim p \vee q$	$\sim r$	
T	T	T	F	T	T	F	T		
T	T	F	T	T	T	T	T	T	←-- critical row
T	F	T	F	T	T	T	F		
T	F	F	T	F	F	T	F		
F	T	T	F	T	T	F	T		
F	T	F	T	T	T	T	T	T	←-- critical row
F	F	T	F	T	T	T	T	F	←-- critical row
F	F	F	T	F	T	T	T	T	←-- critical row

Notice that the columns 6, 7 and 8 give the truth values of premises and the critical rows are rows 2, 6, 7 and 8. Since there is a critical row (row 7) that has false conclusion, then this argument is **invalid**. ■