

Truth Table

Part 1 - Completing the Truth Tables

Complete the truth tables for each statement provided. Fill in the missing values in the truth tables by evaluating the logical operations.

Statement 1: $\sim(p \rightarrow r) \vee q$

p	q	r	$(p \rightarrow r)$	$\sim(p \rightarrow r)$	$\sim(p \rightarrow r) \vee q$
T	T	T			
T	T	F			
T	F	T			
T	F	F			
F	T	T			
F	T	F			
F	F	T			
F	F	F			

Statement 2: $\sim q \rightarrow (\sim p \vee r)$

p	q	r	$\sim q$	$\sim p$	$\sim p \vee r$	$\sim q \rightarrow (\sim p \vee r)$
T	T	T				
T	T	F				
T	F	T				
T	F	F				
F	T	T				
F	T	F				
F	F	T				
F	F	F				

Statement 3: $(p \wedge \sim r) \vee q$

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

Statement 4: $(\sim p \rightarrow \sim r) \vee q$

p	q	r	$\sim p$	$\sim r$	$\sim p \rightarrow \sim r$	$(\sim p \rightarrow \sim r) \vee q$
T	T	T				
T	T	F				
T	F	T				
T	F	F				
F	T	T				
F	T	F				
F	F	T				
F	F	F				

Part 2 - Determining Equivalent Statements:

Once you have completed the truth tables, compare the truth values of the statements. Choose the letter of the correct answer.

_____ 1. Statement 1 is logically equivalent to _____.

- a) Statement 2: $\sim q \rightarrow (\sim p \vee r)$
- b) Statement 3: $(p \wedge \sim r) \vee q$
- c) Statement 4: $(\sim p \rightarrow \sim r) \vee q$
- d) None of the above

_____ 2. Statement 4 is logically equivalent to _____.

- a) Statement 1: $\sim(p \rightarrow r) \vee q$
- b) Statement 2: $\sim q \rightarrow (\sim p \vee r)$
- c) Statement 3: $(p \wedge \sim r) \vee q$
- d) None of the above