

Introduction to Logical Reasoning

Workshop on Assessing Arguments With Truth Tables

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Part I, Problem 1 Solution

1. $p \rightarrow (q \& r).$

2. $\sim p.$

$\therefore \sim r.$

			Premise 1	Premise 2	Conclusion	
p	q	r	$q \& r$	$p \rightarrow (q \& r)$	$\sim p$	$\sim r$
T	T	T	T	T	F	F
T	T	F	F	F	F	T
T	F	T	F	F	F	F
T	F	F	F	F	F	T
F	T	T	T	T	T	F
F	T	F	F	T	T	T
F	F	T	F	T	T	F
F	F	F	F	T	T	T

Invalid!

Part I, Problem 2 Solution

1. $p \vee q.$

2. $\sim p.$

$\therefore q.$

This is a common argument pattern known as the **disjunctive syllogism**.

		Conclusion	Premise 1	Premise 2
p	q	$p \vee q$	$\sim p$	
T	T	T	F	
T	F	T	F	
F	T	T	T	Valid!
F	F	F	T	

Part I, Problem 3 Solution

1. $p \rightarrow q$.
2. $q \rightarrow r$.
—
 $\therefore p \rightarrow r$.

This is a common argument pattern known as the **hypothetical syllogism**.

Premise 1 Premise 2 Conclusion

p	q	r	$p \rightarrow q$	$q \rightarrow r$	$p \rightarrow r$
T	T	T	T	T	T
T	T	F	T	F	F
T	F	T	F	T	T
T	F	F	F	T	F
F	T	T	T	T	T
F	T	F	T	F	T
F	F	T	T	T	T
F	F	F	T	T	T

Valid!

Part 2, Problem 1 Solution

1. $K \vee A$.

2. $K \rightarrow \sim W$.

3. W .

$\therefore A$.

				Premise 3	Premise 1	Premise 2
				Conclusion		
K	A	W	$\sim W$	$K \vee A$	$K \rightarrow \sim W$	
T	T	T	F	T	F	
T	T	F	T	T	T	
T	F	T	F	T	F	
T	F	F	T	T	T	
F	T	T	F	T	T	Valid!
F	T	F	T	F	T	
F	F	T	F	F	T	
F	F	F	T	F	T	

Part 2, Problem 2 Solution

1. $(W \& F) \& [(W \& F) \rightarrow \sim K].$

$\therefore \sim K.$

Conclusion

Premise 1

W	F	K	W & F	$\sim K$	$(W \& F) \rightarrow \sim K$	$(W \& F) \& [(W \& F) \rightarrow \sim K]$
T	T	T	T	F	F	F
T	T	F	T	T	T	T
T	F	T	F	F	T	F
T	F	F	F	T	T	F
F	T	T	F	F	T	F
F	T	F	F	T	T	F
F	F	T	F	F	T	F
F	F	F	F	T	T	F

Valid!

Next Class...

You will learn an alternative way to assess the validity of arguments without using truth tables.

Also, please don't forget to turn in your response to the Workshop #6 Questionnaire on your way out.