

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
F	F	F	T

Valid!

Part I, Problem 3 Solution

$$\begin{array}{l} 1. p \rightarrow q \\ 2. q \rightarrow r \\ \hline \therefore p \rightarrow r \end{array}$$

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!

Question 2

Are you done with Part II of the workshop?

(**A**) No.

(**B**) Yes.

(**C**) Yes!

(**D**) Yes!!

(**E**) Yes yes yes, already!

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			
F	T	F	T	F	T			Valid!
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.

In the meantime, have a great Spring Break... but! Don't forget, there is a quiz on this the Sunday we resume classes. So do review this stuff.