

Phi 270 F96 test 2

1. Analyze the sentence below in as much detail as possible. Be sure that the unanalyzed components of your answer are complete and independent sentences and that you respect any grouping in the English.

Either Bob didn't call or neither Alice nor Carol was home

answer

2. Synthesize an idiomatic English sentence expressing the proposition which is assigned to the symbolic form below by the intensional interpretation to its right—i.e., give an English sentence whose analysis would be the following:

$$P \wedge \neg (S \wedge V)$$

P: Ralph went to Portland; S: Ralph went to Seattle; V: Ralph went to Vancouver

answer

Check each of the following claims of entailment. Do not use detachment or attachment rules. If a derivation fails, present a counterexample that divides an open gap.

3. $A \wedge \neg B \Rightarrow \neg (B \wedge C)$

answer

4. $A \wedge \neg B, B \vee C \Rightarrow A \wedge C$

answer

5. $\neg (A \wedge \neg B) \Rightarrow A \vee B$

answer

6. [This question was on a topic not covered in Fo6] Use a series of replacements to show the following:

$$\neg A \wedge \neg (B \wedge C) \Leftrightarrow \neg (A \vee B) \vee \neg (A \vee C)$$

answer

Phi 270 F96 test 2 answers

1. Bob didn't call \vee neither Alice nor Carol was home
 \neg Bob called $\vee \neg$ (Alice was home \vee Carol was home)
 $\neg B \vee \neg (A \vee C)$

either not B or not either A or C

A: Alice was home; B: Bob called ; C: Carol was home

2. Ralph went to Portland $\wedge \neg$ (Ralph went to Seattle \wedge Ralph went to Vancouver)
Ralph went to Portland $\wedge \neg$ Ralph went to both Seattle and Vancouver
Ralph went to Portland \wedge Ralph didn't go to both Seattle and Vancouver

Ralph went to Portland but he didn't go to both Seattle and Vancouver

3.

	$A \wedge \neg B$	1
1 Ext	A	
1 Ext	$\neg B$	(4)
	$B \wedge C$	3
3 Ext	B	(4)
3 Ext	C	
	•	
4 Nc	\perp	2
2 RAA	$\neg (B \wedge C)$	

4.

	$A \wedge \neg B$	1
	$B \vee C$	4
1 Ext	A	(3)
1 Ext	$\neg B$	(6)
	•	
3 QED	A	2
	B	(6)
	$\neg C$	
	•	
6 Nc	\perp	5
5 IP	C	4
	C	(7)
	•	
7 QED	C	4
4 PC	C	2
2 Cnj	$A \wedge C$	

5.

	$\neg (A \wedge \neg B)$	3
	$\neg A$	
	$\neg B$	(6)
	$\neg A$	
	\circ	$\neg A, \neg B \Rightarrow \perp$
	\perp	5
5 IP	A	4
	\bullet	
6 QED	$\neg B$	4
4 Cnj	$A \wedge \neg B$	3
3 CR	\perp	2
2 IP	B	1
1 PE	$A \vee B$	

A B	$\neg (A \wedge \neg B) / A \vee B$
F F	Ⓣ
F T	ⓕ

6. [This question was on a topic not covered in FO6]

$$\begin{aligned}
 & \neg A \wedge \neg (B \wedge C) \\
 & \Leftrightarrow \\
 & \neg A \wedge (\neg B \vee \neg C) \\
 & \Leftrightarrow \\
 & (\neg A \wedge \neg B) \vee (\neg A \wedge \neg C) \\
 & \Leftrightarrow \\
 & \neg (A \vee B) \vee \neg (A \vee C)
 \end{aligned}$$