

Phi 270 Fo4 test 4 in pdf format

Analyze the sentences below in as much detail as possible, providing a key to the non-logical vocabulary you use. *Restate 2 using an unrestricted quantifier.*

1. *Sam checked every lock*
[answer]
2. *No one who was in the office answered the call*
[Remember to restate your answer in 2 using an unrestricted quantifier.]
[answer]
3. *Ralph got the joke if anyone did*
[answer]
4. *Only bestsellers were on every list*
[answer]

Use derivations to show that the following arguments are valid. You may use any rules.

5.
$$\frac{\forall x Fx \quad \forall x \neg Gx}{\forall x (Fx \wedge \neg Gx)}$$

[answer]
6.
$$\frac{(\forall x: Rxa) \forall y Txy}{\forall x (\forall y: Rya) Tyx}$$

[answer]

Use a derivation to show that the following argument is not valid and present a counterexample by describing a structure that divides an open gap. (You may describe the structure either by depicting it in a diagram, as answers in the text usually do, or by giving tables.)

7.
$$\frac{\forall x Rax}{(\forall x: Rxa) Rxx}$$

[answer]

Phi 270 Fo4 test 4 answers

1. *Sam checked every lock*
Every lock is such that (Sam checked it)
 $(\forall x: \underline{x} \text{ is a lock}) \underline{\text{Sam}} \text{ checked } \underline{x}$
 $(\forall x: Lx) Csx$
[C: $\lambda xy (x \text{ checked } y)$; L: $\lambda x (x \text{ is a lock})$; s: *Sam*]
2. *No one who was in the office answered the call*
No one who was in the office is such that (he or she answered

the call)

$(\forall x: x \text{ is a person who was in the office}) \rightarrow \underline{x} \text{ answered } \underline{\text{the call}}$

$(\forall x: \underline{x} \text{ is a person} \wedge \underline{x} \text{ was in } \underline{\text{the office}}) \rightarrow Axc$

$(\forall x: Px \wedge Nxo) \rightarrow Axc$

$\forall x ((Px \wedge Nxo) \rightarrow \neg Axc)$

[A: $\lambda xy (x \text{ answered } y)$; P: $\lambda x (x \text{ is a person})$; N: $\lambda xy (x \text{ was in } y)$; c: *the call*; o: *the office*]

3. *Ralph got the joke if anyone did*
Everyone is such that (Ralph got the joke if he or she did)
 $(\forall x: x \text{ is a person}) \text{ Ralph got the joke if } x \text{ did}$
 $(\forall x: Px) (\underline{\text{Ralph}} \text{ got } \underline{\text{the joke}} \leftarrow \underline{x} \text{ got } \underline{\text{the joke}})$
 $(\forall x: Px) (Grj \leftarrow Gxj)$
 $(\forall x: Px) (Gxj \rightarrow Grj)$

[P: $\lambda x (x \text{ is a person})$; G: $\lambda xy (x \text{ got } y)$; j: *the joke*]

4. *Only bestsellers were on every list*
Only bestsellers are such that (they were on every list)
 $(\forall x: \neg x \text{ is a bestseller}) \rightarrow x \text{ was on every list}$
 $(\forall x: \neg Bx) \rightarrow \text{every list is such that } (x \text{ was on it})$
 $(\forall x: \neg Bx) \rightarrow (\forall y: y \text{ is a list}) x \text{ was on } y$
 $(\forall x: \neg Bx) \rightarrow (\forall y: Ly) Nxy$

[B: $\lambda x (x \text{ is a bestseller})$; L: $\lambda x (x \text{ is a list})$; N: $\lambda xy (x \text{ was on } y)$]

5.

$\forall x Fx$	a: 3																																			
$\forall x \neg Gx$	a: 5																																			
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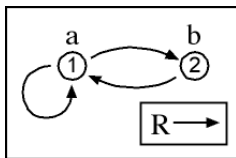
6. $(\forall x: Rxa) \forall y Txy \quad c:3$

(b)	Rca	(3)
(c)	$\forall y Tcy$	b: 4
3 SB	Tcb	(5)
4 UI	•	
5 QED	Tcb	2
2 RUG	$(\forall y: Rya) Tyb$	1
1 UG	$\forall x (\forall y: Rya) Tyx$	

7. $\forall x Rax \quad a:3, b:4$

(b)	Rba	
	$\neg Rbb$	
3 UI	Raa	
4 UI	Rab	
	○	$Rba, \neg Rbb, Raa, Rab \Rightarrow \perp$
	\perp	2
2 IP	Rbb	1
1 RUG	$(\forall x: Rxa) Rxx$	

Counterexample presented by a diagram



Counterexample presented by tables

range: 1, 2

a	b	R	1	2
1	2	1	T	T
		2	T	F