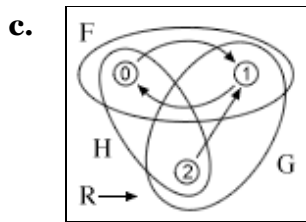
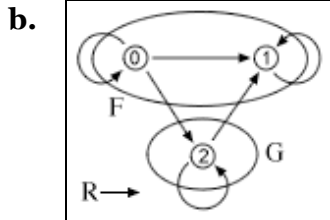


6.4.xa. Exercise answers

1. a.

τ	$F\tau$	τ	$G\tau$	R	0	1	2
0	T	0	F	0	F	F	F
1	T	1	T	1	F	F	T
2	F	2	T	2	T	T	T



2. a. $\frac{(Fa \vee Gb) \rightarrow Rab}{F3 \text{ T T } 4 \text{ } \textcircled{F} \text{ F } 34}$ b. $\frac{R(fca)(fac)}{\textcircled{T} 103 \text{ } 430}$ c. $\frac{fab = fba}{034 \textcircled{F} 243}$

3. a. Without attachment rules: Using attachment rules:

	$a = a \rightarrow Fa$ 2		$a = a \rightarrow Fa$ 2
	$\neg Fa$ (2)	1 CE	$a = a$ X,(2)
2 MTT	$\neg a = a$ (3)	2 MPP	Fa (3)
	•		•
3 DC	\perp 1	3 QED	Fa
1 IP	Fa		

b.

	$\neg (Fa \wedge Fb)$ 3	range: 1, 2	$\frac{a \ b}{1 \ 2}$	$\frac{\tau \ F\tau}{1 \ F}$
	$\neg Fa$		$\neg Fa$	$\neg Fa$
	Fb (3)		Fb	Fb
3 MPT	$\neg Fa$		$\neg Fa$	$\neg Fa$
	•		•	•
	\perp 2		\perp	\perp
2 RAA	$\neg Fb$ 1		$\neg Fb$	$\neg Fb$
1 CP	$\neg Fa \rightarrow \neg Fb$		$\neg Fa \rightarrow \neg Fb$	$\neg Fa \rightarrow \neg Fb$

$\neg (Fa \wedge Fb) / \neg Fa \rightarrow \neg Fb$	$\textcircled{T} \text{ F } 1 \text{ F } 2$	$\text{T } \text{F } 1 \textcircled{F} \text{ F } 2$
---	---	--

c.

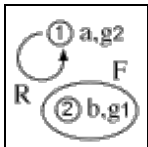
	$a = b \vee b = a$	1
	$a = b$	$a \rightarrow b$
	•	
3 EC	$a = b$	2
	•	
4 EC	$b = a$	2
2 Cnj	$a = b \wedge b = a$	1
	$b = a$	$a \rightarrow b$
	•	
6 EC	$a = b$	5
	•	
7 EC	$b = a$	5
5 Cnj	$a = b \wedge b = a$	1
1 PC	$a = b \wedge b = a$	

d.

	$Fa \rightarrow a = b$	3
	$ga = b$	$a, b \dashv ga$
	$Ra(ga) \rightarrow Fa$	5
	$F(ga)$	
	Raa	(6)
	$\neg R(ga)(ga)$	(6)
	$\neg Fa$	(5)
	$\neg Ra(ga)$	
	○	$b=ga, F(ga), Raa, \neg R(ga)(ga), \neg Fa, \neg Ra(ga) \Rightarrow \perp$
5 MTT		
	\perp	4
4 IP	Fa	3
	$a = b$	$a \dashv b \dashv ga$
	●	
6 Nc=	\perp	3
3 RC	\perp	2
2 IP	$R(ga)(ga)$	1
1 CP	$Raa \rightarrow R(ga)(ga)$	

range: 1, 2

a	b	τ	$g\tau$	τ	$F\tau$	R	1	2
1	2	1	2	1	F	1	T	F
		2	1	2	T	2	F	F



$Fa \rightarrow a = b, ga = b, Ra(ga) \rightarrow Fa, F(ga) / Raa \rightarrow R(ga)(ga)$
 $F1 \textcircled{T} 1 F 2 2 1 \textcircled{T} 2 F 1 2 1 \textcircled{T} F 1 \textcircled{T} 2 1 T 1 1 \textcircled{F} F 2 1 2 1$

e.

	$a = b \rightarrow Rac$	3
	$\neg a = b \rightarrow Rbc$	2
	$\neg Rbc$	(2),(4)
2 MTT	$a = b$	$a \dashv b, c; (3)$
3 MPP	Rac	(4)
	●	
4 Nc=	\perp	1
1 IP	Rbc	