

## 5.4.xa. Exercise answers

1. a.

	$A \rightarrow B$ 2		$\neg A \vee B$ 2
	$A$ (2)		$A$ (2)
2 MPP	$B$ (3)		$B$ (3)
	$\bullet$		$\bullet$
3 QED	$B$ 1		$B$ 1
1 PE	$\neg A \vee B$		$A \rightarrow B$

b.

	$(A \wedge B) \rightarrow C$ 3		$A \rightarrow C$ 3
	$A$ (4)		$A \wedge B$ 2
	$\neg C$ (3)		$A$ (3)
3 MTT	$\neg(A \wedge B)$ 4		$B$ (4)
4 MPT	$\neg B$		$\bullet$
	$\circ$ $A, \neg C, \neg B \Rightarrow \perp$		$C$ 1
	$\perp$ 2		$(A \wedge B) \rightarrow C$
2 IP	$C$ 1		$(A \wedge B) \rightarrow C$
1 CP	$A \rightarrow C$		$(A \wedge B) \rightarrow C$

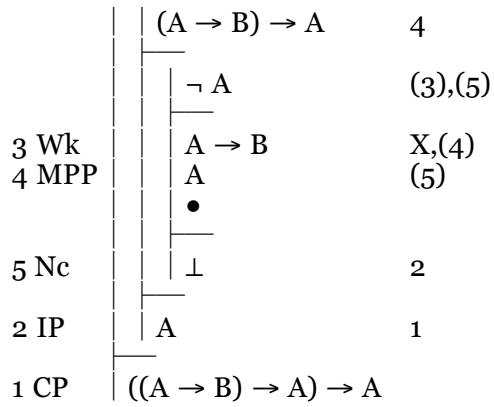
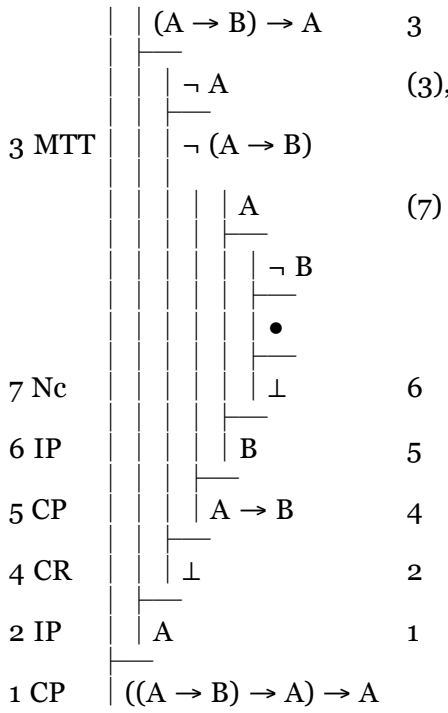
$A$	$B$	$C$	$(A \wedge B) \rightarrow C$	$A \rightarrow C$
T	F	F	F	Ⓣ
T	F	F	Ⓣ	Ⓣ

c.

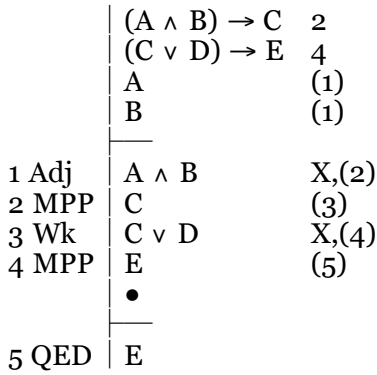
	$A \rightarrow C$ 3,7		$(A \rightarrow B) \wedge (B \rightarrow C)$ 1
	$A$ (3)		$A \rightarrow B$ 3
3 MPP	$C$		$B \rightarrow C$ 4
	$\neg B$		$A$ (3)
	$\circ$ $A, C, \neg B \Rightarrow \perp$		$B$ (4)
	$\perp$ 4		$C$ (5)
4 IP	$B$ 2		$\bullet$
2 CP	$A \rightarrow B$ 1		$C$ 2
	$B$		$A \rightarrow C$
	$\neg C$ (7)		$(A \rightarrow B) \wedge (B \rightarrow C)$
7 MTT	$\neg A$		$\circ$ $B, \neg C, \neg A \Rightarrow \perp$
	$\perp$ 6		$\perp$ 6
6 IP	$C$ 5		$C$ 5
5 CP	$B \rightarrow C$ 1		$B \rightarrow C$ 1
1 Cnj	$(A \rightarrow B) \wedge (B \rightarrow C)$		$(A \rightarrow B) \wedge (B \rightarrow C)$

$A$	$B$	$C$	$A \rightarrow C$	$(A \rightarrow B) \wedge (B \rightarrow C)$
T	F	T	Ⓣ	F
T	F	F	Ⓣ	T
F	T	F	Ⓣ	Ⓣ

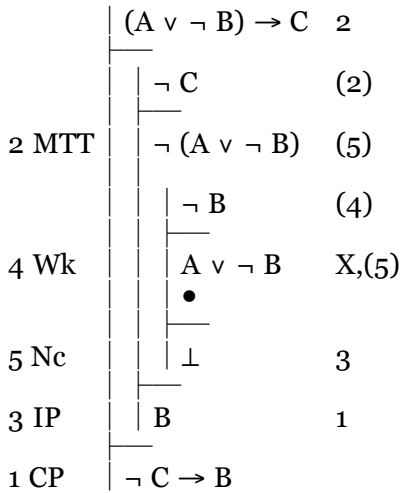
d. The following are two approaches to this derivation, one without use of attachment rules and the other using one of the forms of Wk for the conditional.



2. a.



b.



**c.**

	$\neg (A \wedge B)$	2
	$B \vee C$	3
	$D \rightarrow \neg C$	
	A	(2)
2 MPT	$\neg B$	(3)
3 MTP	C	(4)
4 MTT	$\neg D$	(5)
	•	
5 QED	$\neg D$	1
1 CP	$A \rightarrow \neg D$	

**d.**

	$C \rightarrow \neg (A \vee B)$	3
	$E \vee \neg (D \wedge \neg C)$	5
	D	(4)
	A	(2)
2 Wk	$A \vee B$	X,(3)
3 MTT	$\neg C$	(4)
4 Adj	$D \wedge \neg C$	X,(5)
5 MTP	E	(6)
	•	
6 QED	E	1
1 CP	$A \rightarrow E$	

**e.**

	<i>Tom will go through Chicago and visit Sue</i>	1
	<i>Tom won't go through both Chicago and Indianapolis</i>	2
	<i>Tom won't visit Ursula without going through Indianapolis</i>	3
1 Ext	<i>Tom will go through Chicago</i>	(2)
1 Ext	<i>Tom will visit Sue</i>	(4)
2 MPT	<i>Tom won't go through Indianapolis</i>	(3)
3 MPT	<i>Tom won't visit Ursula</i>	(4)
4 Adj	<i>Tom will visit Sue but not Ursula</i>	X,(5)
	•	
5 QED	<i>Tom will visit Sue but not Ursula</i>	

<b>f.</b>		<i>Either we spend a bundle on television or we won't have wide public exposure</i>	1
		<i>If we spend a bundle on television, we'll go into debt</i>	2
		<i>Either we have wide public exposure or our contributions will dry up</i>	4
		<i>We'll go into debt if our contributions dry up and we don't have large reserves</i>	6
		<i>We won't have large reserves</i>	(5)
		_____	
		<i>We'll spend a bundle on television</i>	(2)
2 MPP		<i>We'll go into debt</i>	(3)
		•	
		_____	
3 QED		<i>We'll go into debt</i>	1
		_____	
		<i>We won't have wide public exposure</i>	(4)
4 MTP		<i>Our contributions will dry up</i>	(5)
5 Adj		<i>Our contributions dry up and we won't have large reserves</i>	X,(6)
6 MPP		<i>We'll go into debt</i>	(7)
		•	
		_____	
7 QED		<i>We'll go into debt</i>	1
		_____	
1 PC		<i>We'll go into debt</i>	
<b>g.</b>		<i>If Adams supports the plan, it will go through provided Brown doesn't oppose it</i>	3
		<i>Brown won't oppose the plan if either Collins or Davis supports it</i>	5
		_____	
		<i>Both Adams and Davis will support the plan</i>	2
		_____	
2 Ext		<i>Adams will support the plan</i>	(3)
2 Ext		<i>Davis will support the plan</i>	(4)
3 MPP		<i>The plan will go through provided Brown doesn't oppose it</i>	6
4 Wk		<i>Either Collins or Davis will support the plan</i>	X,(5)
5 MPP		<i>Brown won't oppose the plan</i>	(6)
6 MPP		<i>The plan will go through</i>	(7)
		•	
		_____	
7 QED		<i>The plan will go through</i>	1
		_____	
1 CP		<i>The plan will go through if both Adams and Davis support it</i>	