

2.2.xa. Exercise answers

1.

		$(A \wedge C) \wedge B$	
	1 Ext	$(A \wedge C) \wedge B$	1 Ext
		B	2 Ext
4 QED		B	5 QED
		B	C
3 Cnj		B	C
		$B \wedge C$	

2. a.

	$A \wedge B$	1
1 Ext	A	(4)
1 Ext	B	(3)
	•	
3 QED	B	2
	•	
4 QED	A	2
2 Cnj	$B \wedge A$	

b.

	A	(2),(3)
	•	
2 QED	A	1
	•	
3 QED	A	1
1 Cnj	$A \wedge A$	

c.

	$A \wedge (B \wedge C)$	1
1 Ext	A	(7)
1 Ext	$B \wedge C$	2
2 Ext	B	(6)
2 Ext	C	(5)
5 QED	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border-left: 1px solid black; border-right: 1px solid black; padding: 0 5px; margin-right: 5px;"> <div style="border-bottom: 1px solid black; padding: 2px;">C</div> </div> <div style="text-align: center; padding: 0 5px;">•</div> </div>	4
6 QED	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border-left: 1px solid black; border-right: 1px solid black; padding: 0 5px; margin-right: 5px;"> <div style="border-bottom: 1px solid black; padding: 2px;">B</div> </div> <div style="text-align: center; padding: 0 5px;">•</div> </div>	4
4 Cnj	<div style="border-bottom: 1px solid black; padding: 2px;">$C \wedge B$</div>	3
7 QED	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border-left: 1px solid black; border-right: 1px solid black; padding: 0 5px; margin-right: 5px;"> <div style="border-bottom: 1px solid black; padding: 2px;">A</div> </div> <div style="text-align: center; padding: 0 5px;">•</div> </div>	3
3 Cnj	$(C \wedge B) \wedge A$	

d.

	A	(7)
	$B \wedge C$	1
	D	
1	B	(6)
1	C	(5)
5 QED	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border-left: 1px solid black; border-right: 1px solid black; padding: 0 5px; margin-right: 5px;"> <div style="border-bottom: 1px solid black; padding: 2px;">C</div> </div> <div style="text-align: center; padding: 0 5px;">•</div> </div>	3
6 QED	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border-left: 1px solid black; border-right: 1px solid black; padding: 0 5px; margin-right: 5px;"> <div style="border-bottom: 1px solid black; padding: 2px;">B</div> </div> <div style="text-align: center; padding: 0 5px;">•</div> </div>	4
7 QED	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border-left: 1px solid black; border-right: 1px solid black; padding: 0 5px; margin-right: 5px;"> <div style="border-bottom: 1px solid black; padding: 2px;">A</div> </div> <div style="text-align: center; padding: 0 5px;">•</div> </div>	4
4 Cnj	<div style="border-bottom: 1px solid black; padding: 2px;">$B \wedge A$</div>	3
3 Cnj	$C \wedge (B \wedge A)$	2
2 Cnj	$(C \wedge (B \wedge A)) \wedge B$	2

e.	$A \wedge (B \wedge C)$	1
1 Ext	A	(7),(9)
1 Ext	$B \wedge C$	2
2 Ext	B	(6)
2 Ext	C	(8)
	<div style="border-left: 1px solid black; padding-left: 5px; margin-left: 5px;"> <div style="border-left: 1px solid black; padding-left: 5px; margin-left: 5px;"> <div style="border-left: 1px solid black; padding-left: 5px; margin-left: 5px;">•</div> </div> </div>	
6 QED	B	4
	<div style="border-left: 1px solid black; padding-left: 5px; margin-left: 5px;"> <div style="border-left: 1px solid black; padding-left: 5px; margin-left: 5px;">•</div> </div>	
7 QED	A	4
4 Cnj	$B \wedge A$	3
	<div style="border-left: 1px solid black; padding-left: 5px; margin-left: 5px;"> <div style="border-left: 1px solid black; padding-left: 5px; margin-left: 5px;">•</div> </div>	
8 QED	C	5
	<div style="border-left: 1px solid black; padding-left: 5px; margin-left: 5px;"> <div style="border-left: 1px solid black; padding-left: 5px; margin-left: 5px;">•</div> </div>	
9 QED	A	5
5 Cnj	$C \wedge A$	3
3 Cnj	$(B \wedge A) \wedge (C \wedge A)$	