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**A.2 Chapter 2 Answers**

*Comment.* There are often many equally good ways to prove a sequent. So, if the solution presented here does not match your own proof, you should not immediately assume that yours is wrong—use the website to check your solution!

**Exercise 2.1.1 Proofs: fill in the blanks**ii  $P \vee Q, \sim Q \vee R, \sim P \vdash R$ 

1	(1)	$P \vee Q$	A
2	(2)	$\sim Q \vee R$	A
3	(3)	$\sim P$	A
1,3	(4)	$Q$	1,3 $\vee E$
1,2,3	(5)	$R$	2,4 $\vee E$

*Alternatively, one could apply  $\vee E$  to lines 2 and 4 at the last step.*

iii  $P \rightarrow Q, P \vee Q \vdash Q$ 

1	(1)	$P \rightarrow Q$	A
2	(2)	$P \vee Q$	A
3	(3)	$\sim Q$	A
2,3	(4)	$P$	2,3 $\vee E$
1,2,3	(5)	$Q$	1,3 $\rightarrow E$
1,2	(6)	$Q$	3,5 RAA (3)

iv  $\sim P \leftrightarrow Q, \sim Q \vee R \vdash \sim P \rightarrow R$ 

1	(1)	$\sim P \leftrightarrow Q$	A
2	(2)	$\sim P$	A
3	(3)	$\sim Q \vee R$	A
1	(4)	$\sim P \rightarrow Q$	1 $\leftrightarrow E$
1,2	(5)	$Q$	2, 4 $\rightarrow E$
1,2,3	(6)	$R$	3,5 $\vee E$
1,3	(7)	$\sim P \rightarrow R$	6 $\rightarrow I$ (2)

**Exercise 2.1.2 Easier proofs**i  $P \vee \sim R, \sim R \rightarrow S, \sim P \vdash S$ 

1	(1)	$P \vee \sim R$	A
2	(2)	$\sim R \rightarrow S$	A
3	(3)	$\sim P$	A
1,3	(4)	$\sim R$	1,3 $\vee E$
1,2,3	(5)	$S$	2,4 $\rightarrow E$