

## Stepwise Derivation Practice

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	1	$P \supset Q$	A	(Hint, use $\sim$ !)
	2	$\sim Q$	A	Derive $\sim P$
	1	3	P	A1
	1	4	Q	1,3 $\supset$ I
	1	5	$Q \ \& \ \sim Q$	2,4 $\&$ I
	!	6	$\sim P$	3-5 $\sim$ I
				QED

	1	$R \vee \sim Q$	A	(hint, use $\vee$ E)
	2	$R \supset \sim Q$	A	Derive $\sim Q$
	1a	3	R	A1a
	1a	4	$\sim Q$	2,3 $\supset$ E
	1b	5	$\sim Q$	A1b
	!	6	$\sim Q$	1,3-4,5-5 $\vee$ E
				QED

	1	$P \supset Q$	A	
	2	$R \vee \sim Q$	A	
	3	$R \supset \sim Q$	A	Derive $(\sim P \ \& \ \sim Q) \vee R$
	1a	4	R	A1a
	1a	5	$\sim Q$	3,4 $\supset$ E
	1b	6	$\sim Q$	A1b
	!	7	$\sim Q$	2,4-5,6-6 $\vee$ E
	2	8	P	A2
	2	9	Q	1,8 $\supset$ I
	2	10	$Q \ \& \ \sim Q$	7,9 $\&$ I
	!	11	$\sim P$	8-10 $\sim$ I
		12	$\sim P \ \& \ \sim Q$	7,11 $\&$ I
		13	$(\sim P \ \& \ \sim Q) \vee R$	12 $\vee$ I
				QED

## Stepwise Derivation Practice

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	1	$R \vee \sim Q$	A	
	2	$R \supset \sim Q$	A	Derive $(P \supset Q) \supset [(\sim P \ \& \ \sim Q) \vee R]$
1	3	$P \supset Q$	A1	For $\supset$ I
2a 1	4	R	A2a	For $\vee$ E ( $\sim Q$ )
2a 1	5	$\sim Q$	2,4 $\supset$ E	First half done
2b 1	6	$\sim Q$	A2b	Second half of $\vee$ E
! 1	7	$\sim Q$	1,4-5,6-6 $\vee$ E	
3 1	8	P	A2	For $\sim$ I
3 1	9	Q	3,8 $\supset$ I	
3 1	10	$Q \ \& \ \sim Q$	7,9 $\&$ I	contradiction
! 1	11	$\sim P$	8-10 $\sim$ I	
1	12	$\sim P \ \& \ \sim Q$	7,11 $\&$ I	
1	13	$(\sim P \ \& \ \sim Q) \vee R$	12 $\vee$ I	
!	14	$(P \supset Q) \supset [(\sim P \ \& \ \sim Q) \vee R]$	3-13 $\supset$ I	QED