

### 6.3.xa. Exercise answers

Some of the derivations below are given twice, once using only the basic identity rules EC, DC, QED=, and Nc= and a second time using MPP= and similar extensions for equations of other rules (see [6.3.3](#)); either approach is entirely acceptable.

**1.**

	$Fa \rightarrow Ga$	1
	$Fa$	(1)
	$a = b$	$a-b$
1 MPP	$Ga$	(2)
	•	
2 QED=	$Gb$	

**2.**

	$Fa \rightarrow Ga$	2			$Fa \rightarrow Ga$	1
	$Fb$	(3)			$Fb$	(1)
	$a = b$	$a-b$			$a = b$	$a-b$
2 MTT	$\neg Ga$	(2)	1 MPP=		$Ga$	(2)
	$\neg Fa$	(3)			•	
3 Nc=	$\perp$	1	2 QED		$Ga$	
1 IP	$Ga$					

**3.**

	$Fa \wedge a = gb$	1
1 Ext	$Fa$	(4)
1 Ext	$a = gb$	$a-gb, b, c, gc$
	$\neg F(gc)$	(4)
	$b = c$	$a-gb-gc, b-c$
	•	
4 Nc=	$\perp$	3
3 RAA	$\neg b = c$	2
2 CP	$\neg F(gc) \rightarrow \neg b = c$	

4.	Fa → G(fa)	3		Fa → G(fa)	2
	G(fb) → Hb	5		G(fb) → Hb	3
	a = b	a—b, fa—fb		a = b	a—b, fa—fb
	Fb	(4)		Fb	(2)
	¬ Ha	(7)		G(fa)	(3)
	•			Hb	(4)
	Fa	3		•	
	G(fa)	6		Ha	1
	•			Fb → Ha	
	G(fb)	5			
Hb	(7)				
•					
⊥	5				
⊥	3				
⊥	2				
Ha	1				
Fb → Ha					

5.	fa = b		a, b—fa, c, d—fc	
	fc = d			
	a = c ∨ b = d			2
	a = c			a—c, b—fa—fc—d
	•			
	fa = d			2
	b = d			a, fa—b—d—fc, c
	•			
	fa = d			2
	fa = d			1
(a = c ∨ b = d) → fa = d				

6.

$v = c$ $b = p$ $\neg Fvt$	$b-p, c-v$ (3)																
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[F:  $\lambda xy$  ( $x$  *is from*  $y$ ); v: *the vice president*; b: *George Bush*; c: *Dick Cheney*; p: *the president*; t: *Texas*]