

Logic Homework – Day Twelve

BRADLEY RETTLER

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Section 5.3: I: 2, 6, 9, 12, 14. II: 3, 6, 8, 11, 15.

Section 5.3: I: 2. Contingent.

G	((G ⊃ G) ⊃ G)					
T	T	T	T	T	T	
F	F	T	F	F	F	

Section 5.3: I: 6. Tautology.

M	P	((M ⊃ P) ∨ (P ⊃ M))						
T	T	T	T	T	T	T	T	T
T	F	T	F	F	T	F	T	T
F	T	F	T	T	T	T	F	F
F	F	F	T	F	T	F	T	F

Section 5.3: I: 9. Contingent.

F	R	X	((X ⊃ (R ⊃ F)) ≡ ((X ⊃ R) ⊃ F))								
T	T	T	T	T	T	T	T	T	T	T	T
T	T	F	F	T	T	T	F	T	T	T	T
T	F	T	T	F	T	T	T	F	F	T	T
T	F	F	F	T	T	T	F	T	F	T	T
F	T	T	T	F	F	T	T	T	T	F	F
F	T	F	F	T	F	F	F	T	T	F	F
F	F	T	T	F	T	T	T	F	F	T	F
F	F	F	F	T	F	F	F	T	F	F	F

Section 5.3: I: 12. Tautology.

H	N	T	$(((H \supset N) \bullet (T \supset N)) \supset ((H \vee T) \supset N))$
T	T	T	T T T T T T T T T T T T
T	T	F	T T T T F T T T T T F T T
T	F	T	T F F F T F F T T T F F
T	F	F	T F F F F T F T T F F F
F	T	T	F T T T T T T T T T T T
F	T	F	F T T T F T T T F F T T
F	F	T	F T F F T F F T T F F
F	F	F	F T F T F T F T F F T F

Section 5.3: I: 14. Tautology.

G	H	N	P	$((((G \bullet N) \supset H) \bullet ((G \supset H) \supset P)) \supset (N \supset P))$
T	T	T	T	T T T T T T T T T T T T
T	T	T	F	T T T T T F T T T F F T F F
T	T	F	T	T F F T T T T T T T T T
T	T	F	F	T F F T T F T T T F F T F F
T	F	T	T	T T T F F T F F T T T T T
T	F	T	F	T T T F F F T F T F T F F
T	F	F	T	T F F T F T T F F T T T
T	F	F	F	T F F T F T T T F T F T F F
F	T	T	T	F F T T T T F T T T T T
F	T	T	F	F F T T T F F T T F F T F F
F	T	F	T	F F F T T T F T T T T T
F	F	F	F	F F F T T F F T T F F F T F F
F	F	T	T	F F T F T F T T T T T T
F	F	T	F	F F T F F F F T T T F F F
F	F	F	T	F F F T F T F T T T T T
F	F	F	F	F F F T F F F F F F F T F F

Section 5.3: II: 3. Consistent.

K	L	($\sim K \supset L$)			
T	T	F	T	T	T
T	F	F	T	T	F
F	T	T	F	T	T
F	F	T	F	F	F

K	L	($K \supset \sim L$)			
T	T	T	F	F	T
T	F	T	T	T	F
F	T	F	T	F	T
F	F	F	T	T	F

Section 5.3: II: 6. Contradictory.

G	H	($H \equiv \sim G$)			
T	T	T	F	F	T
T	F	F	T	F	T
F	T	T	T	T	F
F	F	F	F	T	F

G	H	((G \bullet H) \vee (\sim G \bullet \sim H))							
T	T	T	T	T	F	T	F	F	T
T	F	T	F	F	F	T	F	T	F
F	T	F	F	T	F	T	F	F	T
F	F	F	F	T	T	F	T	T	F

Section 5.3: II: 8. Consistent.

A	E	N	(N • (A ∨ ~ E))					
T	T	T	T	T	T	T	F	T
T	T	F	F	F	T	T	F	T
T	F	T	T	T	T	T	T	F
T	F	F	F	F	T	T	T	F
F	T	T	T	F	F	F	F	T
F	T	F	F	F	F	F	F	T
F	F	T	T	T	F	T	T	F
F	F	F	F	F	F	T	T	F

A	E	N	(~ A • (E ∨ ~ N))					
T	T	T	F	T	F	T	T	F
T	T	F	F	T	F	T	T	F
T	F	T	F	T	F	F	F	T
T	F	F	F	T	F	F	T	F
F	T	T	T	F	T	T	T	F
F	T	F	T	F	T	T	T	F
F	F	T	T	F	F	F	F	T
F	F	F	T	F	F	F	T	F

Section 5.3: II: 11. Contradictory.

E	G	P	(G • (E ∨ P))				
T	T	T	T	T	T	T	T
T	T	F	T	T	T	T	F
T	F	T	F	F	T	T	T
T	F	F	F	F	T	T	F
F	T	T	T	T	F	T	T
F	T	F	T	F	F	F	F
F	F	T	F	F	F	T	T
F	F	F	F	F	F	F	F

E	G	P	(~ (G • E) • ~ (G • P))						
T	T	T	F	T	T	T	F	F	T
T	T	F	F	T	T	T	F	T	F
T	F	T	T	F	F	T	T	T	F
T	F	F	T	F	F	T	T	T	F
F	T	T	T	T	F	F	F	F	T
F	T	F	T	T	F	F	T	T	F
F	F	T	T	F	F	T	T	F	T
F	F	F	T	F	F	T	T	F	F

Section 5.3: II: 15. Contradictory.

F	K	Q	$(Q \supset \sim (K \vee F))$					
T	T	T	T	F	F	T	T	T
T	T	F	F	T	F	T	T	T
T	F	T	T	F	F	F	T	T
T	F	F	F	T	F	F	T	T
F	T	T	T	F	F	T	T	F
F	T	F	F	T	F	T	T	F
F	F	T	T	T	T	F	F	F
F	F	F	F	T	T	F	F	F

F	K	Q	$((K \bullet Q) \vee (F \bullet Q))$					
T	T	T	T	T	T	T	T	T
T	T	F	T	F	F	F	T	F
T	F	T	F	F	T	T	T	T
T	F	F	F	F	F	F	T	F
F	T	T	T	T	T	T	F	F
F	T	F	T	F	F	F	F	F
F	F	T	F	F	T	F	F	F
F	F	F	F	F	F	F	F	F