

Homework # 8

PHIL-205-01:Symbolic Logic

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11/17/2021

1 Section 1

Annotate the following proof.

1. $\exists x Jx$	
2. $\exists x \neg Jx$	
3. Ja	
4. $\neg Jb$	
5. $a = b$	=Elim: 5, 3
6. Jb	\perp Intro: 4, 6
7. \perp	\neg Intro: 5-7
8. $\neg a = b$	\exists Intro: 8
9. $\exists y \neg a = y$	\exists Intro: 9
10. $\exists x \exists y \neg x = y$	\exists Elim: 2, 4 – 10
11. $\exists x \exists y \neg x = y$	\exists Elim: 1, 3 – 11
12. $\exists x \exists y \neg x = y$	

2 Section 2

Annotate the following proof.

1. $\exists x \exists y (\neg x = y \wedge Gx \wedge Gy)$
2. $\forall x (Gx \rightarrow Hx)$
3. $\exists x \forall y (Hy \leftrightarrow y = x)$
4. $\exists y (\neg a = y \wedge Ga \wedge Gy)$
5. $\neg a = b \wedge Ga \wedge Gb$
6. $\forall y (Hy \leftrightarrow y = c)$
7. $Ga \rightarrow Ha$
8. Ga
9. Ha
10. $Gb \rightarrow Hb$
11. Gb
12. Hb
13. $Ha \leftrightarrow a = c$
14. $a = c$
15. $Hb \leftrightarrow b = c$
16. $b = c$
17. $a = b$
18. $\neg a = b$
19. \perp
20. \perp
21. \perp
22. \perp
23. $\neg \exists x \forall y (Hy \leftrightarrow y = x)$

\forall Elim: 2
 \wedge Elim: 5
 \rightarrow Elim: 7, 8
 \forall Elim: 2
 \wedge Elim: 5
 \rightarrow Elim: 7, 8
 \forall Elim: 6
 \leftrightarrow Elim: 13, 9
 \forall Elim: 6
 \leftrightarrow Elim: 15, 12
 $=$ Elim: 14, 16
 \wedge Elim: 5
 \perp Intro: 17, 18
 \exists Elim: 6 – 19
 \exists Elim: 5 – 20
 \exists Elim: 4 – 21
 \neg Intro: 3–22