

Intermediate Logic

Homework #20

(Due: 3/5/2013)

Read pages 66-71 in the *Intermediate Logic* text and complete the exercises.

Exercise 15 (page 68)

Using the shorter truth-table method, determine the consistency of the following proposition sets. With problems 6 and 7, use the constants given.

1. $\underline{p \quad \sim p \supset r}$ 2. $\underline{\sim\sim p \quad \sim p \bullet q}$ 3. $\underline{p \supset q \quad p \quad \sim q}$

4. $\underline{p \vee q \quad \sim p}$ 5. $\underline{p \equiv q \quad q \equiv r \quad p \quad \sim r}$

6. Mr. Copia owns a Porche and a mansion. *If he doesn't own a mansion then he either owns a Porche or it's my imagination.* It's your imagination. (P, M, I)

7. If I learn grammar or logic then I can use rhetoric. *If you can't use rhetoric then you learn grammar and logic.* (G, L, R)

Exercise 16 (page 71)

Using the shorter truth-table method, determine the equivalence of each pair of propositions.

1. $\underline{\sim(p \bullet q) \quad \sim p \vee \sim q}$ 2. $\underline{p \supset q \quad p \supset (p \bullet q)}$

3. $\underline{p \vee (p \supset q) \quad q \supset p}$ 4. $\underline{p \quad p \vee (p \bullet q)}$

5. If Christ's righteousness is not imputed to you then you are condemned. *Either Christ's righteousness is imputed to you or you are condemned.*

6. Are the following two propositions equivalent?

$$[(\sim p \bullet r) \vee (q \bullet r)] \quad \underline{\hspace{2cm}} \quad [(p \supset q) \bullet r]$$

Cranium Calisthenics

The Lady or the Tiger?* - The Fifth Trial: The same rules apply to the fifth trial as those of the fourth. By way of review, in the left-hand room (Room I), if a lady is in it, then the sign on the door is true, but if a tiger is in it, the sign on the door is false. In the right-hand room (Room II), the situation is the opposite: a lady in the room means the sign on the door is false, and a tiger in the room means the sign is true. Again, each room contains either a lady or a tiger. It is possible that both rooms contain ladies or both rooms contain tigers, or that one room contains a lady and the other a tiger.

I AT LEAST ONE ROOM CONTAINS A LADY

II THE OTHER ROOM CONTAINS A LADY

After the king explained the above rules to the prisoner, he pointed to the signs. Which room should the prisoner pick, and why?



* *The Lady or the Tiger? And Other Logic Puzzles*, by Raymond Smullyan. Random House, Inc. 1982.