

## Intermediate Logic

## Homework #25

(Due: 4/16/2013)

Read pages 102-108 in the *Intermediate Logic* text and complete the exercises.**Exercise 24** (pages 105-106)

Write a formal proof of validity for each of the following arguments.

1. 1.  $A / \therefore B \supset A$

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

2. 1.  $C \supset (D \supset E) / \therefore D \supset (C \supset E)$

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

3. 1.  $F \supset (G \bullet H) / \therefore F \supset G$

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

4. 1.  $I \supset J / \therefore I \supset (J \vee K)$

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

5. 1.  $L \supset N / \therefore (L \bullet M) \supset N$

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

6. 1.  $P \supset Q$

2.  $\sim Q / \therefore P \equiv Q$

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7. 1.  $\sim R \supset (S \vee T)$

2.  $\sim S$

3.  $\sim T / \therefore R$

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7. \_\_\_\_\_

8. 1.  $U \supset W$

2.  $\sim(U \supset X) / \therefore W$

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7. \_\_\_\_\_

9. 1.  $A \supset (B \bullet C)$
2.  $(B \vee C) \supset D / \therefore A \supset D$
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_

10. 1.  $E / \therefore F \supset F$  (Hint: Use Impl. three times)
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_

11. 1.  $(G \vee H) \supset I$
2.  $(J \vee K) \supset \sim I$
3.  $K / \therefore \sim H$
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_

12. 1.  $(L \vee M) \supset N$
2.  $P \supset M$
3.  $\sim N / \therefore \sim P \bullet \sim L$
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_

Write out in English an argument that could be symbolized by the problems identified below. Do they sound valid? Why or why not?

13. Problem #1

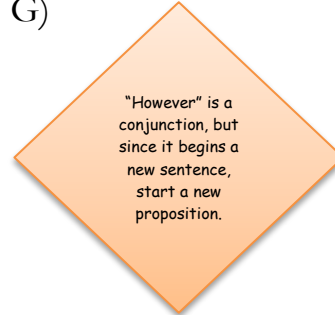
14. Problem #10

**Exercise 25** (pages 107-108)

Translate the following arguments into symbolic form. Write a formal proof of validity for each. Each proof requires no more than four additional steps.

1. If evolutionary theory is correct then the biblical creation account is false. However, if the Bible is God's word then the biblical creation account is true. Therefore if evolutionary theory is correct then the Bible is not God's word. (E, C, G)

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_



2. It is impossible to both spend eternity in heaven and be condemned to hell. So if you got to heaven you will not be condemned to hell. (H, C)

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_

3. If Jesus both helped others and argued rationally then he was not insane. If the gospel accounts are true then Jesus argued rationally and he helped others. Thus either the gospel accounts are false or Jesus was not insane. (H, A, I, G)

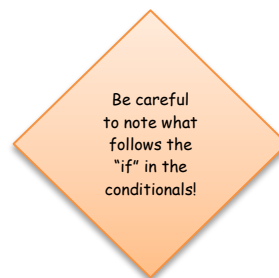
- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_
- 5. \_\_\_\_\_

4. If God and Satan are both omnipotent then our cosmology is essentially dualistic. God is omnipotent. We must conclude that if Satan is also omnipotent then our cosmology is dualistic. (G, S, D)

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_

5. If the heavens are infinite then I cannot comprehend them, but neither can I comprehend them if they come to an end. If the heavens are not infinite then they come to an end. In any case, I cannot comprehend the heavens. (I, C, E)

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_



6. Either Peter was a liar when he claimed that Jesus never lied, or Jesus never lied. If Peter was a liar when he made this claim then he was a hypocrite. Peter was no hypocrite. Therefore Jesus was no liar. (P, J, H)

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_



### Optional Extra Credit/Extra Practice

Here are a few optional extra practice problems. If you had difficulty with any of the problems in Exercise 24, completing these will make up some points (you must at least attempt all of the problems in Exercise 24 for credit, however). If you got all of the problems correct, they are worth one extra credit point each.

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> <li>1. 1. <math>\sim A \supset A / \therefore A</math></li> <li>2. _____</li> <li>3. _____</li> <li>4. _____</li> </ol>                                         | <ol style="list-style-type: none"> <li>2. 1. <math>[(K \vee L) \vee M] \vee N / \therefore (N \vee K) \vee (L \vee M)</math></li> <li>2. _____</li> <li>3. _____</li> <li>4. _____</li> </ol>                                                              |
| <ol style="list-style-type: none"> <li>3. 1. <math>(Z \vee A) \vee B</math></li> <li>2. <math>\sim A / \therefore Z \vee B</math></li> <li>3. _____</li> <li>4. _____</li> <li>5. _____</li> </ol> | <ol style="list-style-type: none"> <li>4. 1. <math>[R \supset (S \supset T)] \bullet [(R \bullet T) \supset U]</math></li> <li>2. <math>R \bullet (S \vee T) / \therefore T \vee U</math></li> <li>3. _____</li> <li>4. _____</li> <li>5. _____</li> </ol> |

## Cranium Calisthenics

The Lady or the Tiger?\* - (The Ninth Trial) "Confound it," said the king. "Again all the prisoners won! I think tomorrow I'll have *three* rooms instead of two; I'll put a lady in one room and a tiger in each of the other two rooms. Then we'll see how the prisoners fare!" So, on the third day, the king did as planned. He offered three rooms to choose from, and he explained to the prisoner that one room contained a lady and the other two contained tigers. Here are the three signs:

I  
A TIGER IS IN  
THIS ROOM

II  
A LADY IS IN  
THIS ROOM

III  
A TIGER IS IN  
ROOM II

The king explained that at most one of the three signs was true. Which room contains the lady? (Explain!)



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