

Intermediate Logic

Homework #26

(Due: 4/23/2013)

Read pages 109-116 in the *Intermediate Logic* text and complete the exercises.**Exercise 26** (pages 112-113)

Write a formal proof of validity for the following arguments using the Conditional Proof.

1. 1. $A \supset (B \bullet C) / \therefore A \supset B$

2. _____

3. _____

4. _____

5. _____

3. 1. $G \supset H$

2. $G \supset I / \therefore G \supset (H \bullet I)$

3. _____

4. _____

5. _____

6. _____

7. _____

5. 1. $M \supset N$

2. $P \supset \sim N / \therefore \sim M \vee \sim P$

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

7. 1. $U / \therefore W \supset W$

2. _____

3. _____

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

2. _____

3. _____

4. _____

5. _____

4. 1. $J \supset K$

2. $L \supset K / \therefore (J \vee L) \supset K$

3. _____

4. _____

5. _____

6. _____

7. _____

6. 1. $Q \supset (R \bullet S)$

2. $(R \vee S) \supset T / \therefore Q \supset T$

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

8. 1. $X / \therefore Y \supset X$

2. _____

3. _____

9. 1. $(A \supset B) \bullet (C \supset D) / \therefore (A \bullet C) \supset (B \bullet D)$
 2. _____
 3. _____
 4. _____
 5. _____
 6. _____
 7. _____
 8. _____
 9. _____
 10. _____
 11. _____
 12. _____

Challenge: Solve problem nine without using the Conditional Proof.

1. $(A \supset B) \bullet (C \supset D) / \therefore (A \bullet C) \supset (B \bullet D)$
 2. _____
 3. _____
 4. _____
 5. _____
 6. _____
 7. _____
 8. _____
 9. _____
 10. _____
 11. _____
 12. _____
 13. _____
 14. _____

Exercise 27 (page 116)

Write a formal proof of validity for the following arguments using Reduction ad Absurdum.

1. 1. $\sim P \supset (Q \vee R)$
 2. $\sim Q$
 3. $\sim R / \therefore P$
 4. _____
 5. _____
 6. _____
 7. _____
 8. _____

2. 1. $(\sim P \vee Q) \supset (R \bullet S)$
 2. $\sim R / \therefore P$
 3. _____
 4. _____
 5. _____
 6. _____
 7. _____
 8. _____

3. 1. $P \supset Q$
2. $Q \vee P / \therefore Q$
3. _____
4. _____
5. _____
6. _____
7. _____

4. 1. $P / \therefore Q \supset Q$
2. _____
3. _____
4. _____
5. _____
6. _____

CHALLENGE: Solve problem three without using Reductio ad Absurdum. (Hint: you can *any* of the other 20 rules!)
 ⚠ Warning: this one is HARD!!! If you can do it, it's worth an extra credit point. If you can't, do not worry.

1. $P \supset Q$
2. $Q \vee P / \therefore Q$
3. _____
4. _____
5. _____
6. _____
7. _____

Cranium Calisthenics

The Lady or the Tiger?* - (The Tenth Trial) Again there was only one lady and two tigers. The king explained to the prisoner that the sign on the door of the room containing the lady was true, and that at least one of the other two signs was false. Here are the three signs:



I
A TIGER IS IN
ROOM II

II
A TIGER IS IN
THIS ROOM

III
A TIGER IS IN
ROOM I



What should the prisoner do? (Explain.)

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