

**HW#3** Due in class Monday, 5 Oct  
 Phi 321 Formal Logic  
 Fall 2015, Jared Bates

**Directions:** Complete the annotation for the below derivations. Identify which are proofs of theorems. [Like 5.1.5E (187-9).]

**1. DERIVE: G**

|     |                 |
|-----|-----------------|
| 1.  | $S \vee \sim L$ |
| 2.  | $S \supset G$   |
| 3.  | $L$             |
| 4.  | $S$             |
| 5.  | $G$             |
| 6.  | $\sim L$        |
| 7.  | $\sim G$        |
| 8.  | $\sim L$        |
| 9.  | $L$             |
| 10. | $G$             |
| 11. | $G$             |

**3. DERIVE:  $\sim(N \& H)$**

|     |                                 |
|-----|---------------------------------|
| 1.  | $(B \vee N) \supset (R \& E)$   |
| 2.  | $((\sim E \& F) \equiv S) \& S$ |
| 3.  | $N \& H$                        |
| 4.  | $N$                             |
| 5.  | $B \vee N$                      |
| 6.  | $R \& E$                        |
| 7.  | $S$                             |
| 8.  | $(\sim E \& F) \equiv S$        |
| 9.  | $\sim E \& F$                   |
| 10. | $E$                             |
| 11. | $\sim E$                        |
| 12. | $\sim(N \& H)$                  |

**2. DERIVE:  $(\sim K \equiv A) \supset (K \equiv \sim A)$**

|     |   |
|-----|---|
| 1.  | $\sim K \equiv A$                             |
| 2.  | $K$   |
| 3.  | $A$   |
| 4.  | $K$   |
| 5.  | $\sim K$                                      |
| 6.  | $\sim A$                                      |
| 7.  | $\sim A$                                      |
| 8.  | $\sim K$                                      |
| 9.  | $A$   |
| 10. | $\sim A$                                      |
| 11. | $K$   |
| 12. | $K \equiv \sim A$                             |
| 13. | $(\sim K \equiv A) \supset (K \equiv \sim A)$ |

**4. DERIVE:  $\sim K$**

|     |                               |
|-----|-------------------------------|
| 1.  | $(H \& G) \vee (K \supset G)$ |
| 2.  | $\sim(G \vee L)$              |
| 3.  | $K$                           |
| 4.  | $H \& G$                      |
| 5.  | $G$                           |
| 6.  | $K \supset G$                 |
| 7.  | $G$                           |
| 8.  | $G$                           |
| 9.  | $G \vee L$                    |
| 10. | $\sim(G \vee L)$              |
| 11. | $\sim K$                      |

5. DERIVE:  $\sim(A \equiv C)$

- |     |  |                     |          |       |
|-----|--|---------------------|----------|-------|
| 1.  |  | A $\equiv$ B        |          |       |
| 2.  |  | B $\equiv$ $\sim$ C | _____    |       |
| 3.  |  | A $\equiv$ C        | _____    |       |
| 4.  |  |                     | C        | _____ |
| 5.  |  |                     | A        |       |
| 6.  |  |                     | B        |       |
| 7.  |  |                     | $\sim$ C |       |
| 8.  |  |                     | C        |       |
| 9.  |  | $\sim$ C            |          |       |
| 10. |  | B                   |          |       |
| 11. |  | A                   |          |       |
| 12. |  | C                   |          |       |
| 13. |  | $\sim(A \equiv C)$  |          |       |