Introduction to Logical Reasoning

Workshop on Natural Deduction

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Part I, Problem 1 Solution

1. $(W \vee X) \rightarrow Y$.
2. W.

$\therefore$ Y.

3. $W \vee X$. 2; Add.
4. Y. 1, 3; M.P.

Part I, Problem 2 Solution

1. $D \rightarrow E$.
2. $(E \rightarrow F) \,\&\, (F \rightarrow D)$.

$\therefore D \rightarrow F$.

3. $E \rightarrow F$. 2; Simp.
4. $D \rightarrow F$. 1, 3; H.S.

Part 2, Problem 1 Solution

1. $Q \rightarrow R$.
2. $R \rightarrow S$.
3. $\sim S$.

$\therefore\ \sim Q \,\&\, \sim R$.

4. $\sim R$. 2, 3; M.T.
5. $\sim Q$ 1, 4; M.T.
6. $\sim Q \,\&\, \sim R$. 5, 4; Conj.

Part 3, Problem 1 Solution

1. $L \vee (S \rightarrow Q)$.
2. $\sim L \rightarrow (Q \rightarrow U)$.
3. $\sim L$.

$\therefore S \rightarrow U$.

4. $S \rightarrow Q$. 1, 3; D.S.
5. $Q \rightarrow U$. 2, 3; M.P.
6. $S \rightarrow U$. 4, 5; H.S.

Part 3, Problem 2 Solution

1. $J \rightarrow B$.
2. $(J \,\&\, B) \rightarrow (C \vee M)$.
3. $(C \vee M) \rightarrow {\sim}S$.
4. $(J \rightarrow {\sim}S) \rightarrow P$.

$\therefore$ P.

5. $J \rightarrow (J \,\&\, B)$.	1; Abs.
6. $J \rightarrow (C \vee M)$.	5, 2; H.S.
7. $J \rightarrow {\sim}S$.	6, 3; H.S.
8. P.	4, 7; M.P.

Next Class…

We will do further work with natural deduction.

Do not forget, **Exam #2** is a week from today (March 24th). Anything from units #3, #4, and #5 is fair game. We will have an in-class review session this Tuesday (March 22nd), but please start studying now!