CRITICAL THINKING Workshop #8





Natural Deduction

Professor David Emmanuel Gray



Explanation of Annotations for These Solutions

The problem is in black Futura Std type.

The solution is in red Garamond Premier Pro type.

Any commentary is in blue Futura Std type.

Please Note: When solving these types of problems for a quiz or an exam, you are expected to format your own solutions in a similar manner as I have done on these slides. Failure to do so may result in a small penalty for not following instructions or even a larger penalty because I do not understand your solution.





Part I Solutions



 3. W∨X.
 2; Add.

 4. Y.
 1, 3; M.P.



Part I Solutions





Part II Solutions





Part III Solutions

Either the business students love logic, or the business students study hard only if the professor quizzes them on the material. But if the business students do not love logic, then the professor quizzes them on the material only if he wants them to understand the material. The business students do not love logic. Therefore, if the business students study hard then the professor wants them to understand the material. (L, S, Q, U)





Part III Solutions

2. If the information systems students love logic, then the business students love logic. If both the information systems and business students love logic, then either the computer science or computational biology students love logic. If the computer science or computational biology students love logic, then the professor is not sad. If the information systems students loving logic is a sufficient condition for the professor not being sad, then the dean is pleased. As a result, the dean is pleased. (I, B, S, C, P, D)

 $I \rightarrow B.$ I. 2. $(I \& B) \rightarrow (S \lor C).$ 3. $(S \lor C) \rightarrow \sim P.$ $4. \quad (I \rightarrow \sim P) \rightarrow D.$ D.

 $\mathbf{I} \longrightarrow (\mathbf{I} \& \mathbf{B}).$ ı; Abs. 6. $I \rightarrow (S \lor C)$. 5, 2; H.S. 7. $I \rightarrow \sim P$. 6, 3; H.S. 4, 7; M.P. D. 8.







We will do further work with natural deduction.

