Introduction to Logical Reasoning

Workshop on Natural Deduction

Part I: Each of the following problems presents an valid argument. Use natural deduction to construct that argument's formal proof of validity. Each proof can be completed in just two steps.

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1. 1. $(W \lor X) \rightarrow Y$. 2. W. ∴ Y.

2. 1. $D \rightarrow E$. $\frac{2. \quad (E \to F) \& (F \to D).}{\therefore \quad D \to F.}$

Part II: The following problem presents an valid argument. Use natural deduction to construct the argument's formal proof of validity. This proof can be completed in just *three* steps.

1. 1. $Q \rightarrow R$. 2. $R \rightarrow S$. $\frac{3. ~S.}{\therefore ~Q \& ~R.}$

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Part III: Each of the following problems presents a valid argument in English. Translate each into the language of symbolic logic, putting it into argumentative form. Then use natural deduction to construct that argument's formal proof of validity. Each proof can be completed in no more than *four* steps, but I'm not saying the exact number.

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

If the journalism students love logic, then the business students love logic. If both the journalism and business students love logic, then either the computer science or mathematics students love logic. If the computer science or mathematics students love logic, then the professor is not sad. If the journalism 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. (J, B, C, M, S, P)