TFL Natural Deduction with Conditionals Exercise
PHI 154 (Eliot) Fall 2022

The following is a list of arguments. The premises are separated by commas, and the conclusion comes after the "therefore" symbol, which is "∴" (as introduced on page 2). For each argument, construct a proof of its logical validity using the natural deduction system introduced in class and described in Chapter 16. The inference rules we have learned at this point are ∧I, ∧E, and →E. So those are the only ones you will need for these. (These proofs do not require →I.)

1. $\neg R \to S, S \to Q, \neg R \therefore Q$

2. $(M \lor N) \to N, C \land (M \lor N) \therefore N$

3. $S \land T, T \to \neg G, S \to D \therefore D \land \neg G$

4. $(P \land H) \land (J \land O), (O \land P) \to (C \land O) \therefore C \land O$

5. $C \to (R \to E), M \to C, M \therefore R \to E$

6. $B \to (\neg C \to D), T \to B, \neg C \land T \therefore D$

7. $[(F \land \neg T) \land M] \to A, M \land \neg T, \neg T \to F \therefore A \land F$

8. $(R \land S) \land (P \lor F), S \to [(P \lor F) \to \neg M)] \therefore \neg M$