TFL Natural Deduction with Conditionals Exercise
PHI 154 (Eliot) Fall 2021

For each argument, construct a proof using the natural deduction system described in Chapter 16. The inference rules we have learned at this point are R, $\wedge$I, $\wedge$E, and $\rightarrow$E. These do not require $\rightarrow$I. The premises are separated by commas, and the conclusion comes after the "therefore" symbol, which is "$\therefore$" (as introduced on page 2).

1. $\neg R \rightarrow S, S \rightarrow Q, \neg R \therefore Q$
2. $(M \vee N) \rightarrow N, C \wedge (M \vee N) \therefore N$
3. $S \wedge T, T \rightarrow \neg G, S \rightarrow D \therefore D \wedge \neg G$
4. $(P \wedge H) \wedge (J \wedge O), (O \wedge P) \rightarrow (C \wedge O) \therefore C \wedge O$
5. $C \rightarrow (R \rightarrow E), M \rightarrow C, M \therefore R \rightarrow E$
6. $B \rightarrow (\neg C \rightarrow D), T \rightarrow B, \neg C \wedge T \therefore D$
7. $[(F \wedge \neg T) \wedge M] \rightarrow A, M \wedge \neg T, \neg T \rightarrow F \therefore A \wedge F$
8. $(R \wedge S) \wedge (P \vee F), S \rightarrow [(P \vee F) \rightarrow \neg M)] \therefore \neg M$