TFL Natural Deduction with Conditionals Exercise
PHI 154 (Eliot) Fall 2020

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, $\rightarrow$I, and $\rightarrow$E. Exercises 1–4 do not require our newest rule, $\rightarrow$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. $[(F \wedge \neg T) \wedge M] \rightarrow A, M \wedge \neg T, \neg T \rightarrow F \therefore A \wedge F$
5. $C \rightarrow \neg B, \neg B \rightarrow E \therefore C \rightarrow E$
6. $Z \wedge X, Z \rightarrow H \therefore \neg I \rightarrow (H \wedge X)$
7. $[B \wedge (L \vee M)] \therefore N \rightarrow [(B \wedge N) \wedge (L \vee M)]$
8. $\therefore \neg R \rightarrow \neg R$ *

* You will have noticed that this proof does not include any premises. That's intentional. How can you use the rules we have to prove the given sentence anyway?