When solving a problem such as this, it is easiest to start with the most simple expressions and use those to simplify the longer ones using the rules of inference. The most clear way to answer a problem of this type is to number each true statement, starting with the assumptions—that is, the statements given in the problem—and use the rules of inference to produce new statements. When producing a new statement, you should write down how this one follows from previous ones (the rule of inference used) and from which other statements it follows.

Here is the solution to problem 44 in section 1.3.

1. \( p \rightarrow q \) by assumption
2. \( r \lor s \) by assumption
3. \( \sim s \rightarrow \sim t \) by assumption
4. \( \sim q \lor s \) by assumption
5. \( \sim s \) by assumption
6. \( \sim p \land r \rightarrow u \) by assumption
7. \( w \lor t \) by assumption
8. \( \sim t \) modus ponens from 3 and 5
9. \( \sim q \) elimination from 4 and 5
10. \( w \) elimination from 7 and 8
11. \( \sim p \) modus tollens from 1 and 9
12. \( r \) elimination from 2 and 5
13. \( \sim p \land r \) conjunction from 11 and 12
14. \( u \) modus ponens from 6 and 13
\[ \therefore u \land w \] conjunction from 14 and 10