

## LESSON #16:

### PROPER USE OF SUBPROOFS (6.4) / STRATEGIES & TACTICS (6.5) / More practice with proofs

REMIND STUDENTS TO DOWNLOAD & PRINTOUT PRACTICE MIDTERM EXAM FROM BLACKBOARD 'COURSE DOCUMENTS'. Students should work it and then grade their own work using the PRACTICE MIDTERM ANSWER KEY that I will also post to Blackboard. They should bring their self-graded print-out of the exam with them to class on Thursday.

### POWERPOINT SLIDES #1-11

Work **proof 6.12** as review of the proof rules covered so far. (The overall strategy is a simple proof by cases, but now with Contradiction Intro we have a way to exploit the two contradictory cases in a way that leads to the desired conclusion)

### POWERPOINT SLIDE #12

Recall that in the previous class I gave you three tips on how not to screw up using subproofs:

- You can insert anything as the premise of a subproof, but be sure it will be *useful* to you *in terms of some rule strategy*.
- You can only draw material out of a subproof and use it back at a more basic argument level *if you have a rule that allows you to!*
- Closely related to the above, once a subproof has been discharged (ended), it is only *the subproof as a whole* that is available to justify some later step.

p. 165 of text -- Look at the *fallacious proof* here as illustration of the above points.

p. 167 of text -- Work through this **proof** of one of the **DeMorgan's Laws**. This also illustrates *nested subproofs*, as well as how you can *draw info from earlier levels of a proof* as long as those levels haven't been discharged.

Recall that we also discussed some **strategies for tackling proofs**:

### POWERPOINT SLIDE #13

- 1) Take the time to understand the *meanings* of the sentences in the proof, even if you've already been told the argument is valid.
- 2) Try first writing out an *informal* proof.

- 3) Work backwards. (Start with the conclusion—what additional sentence or sentences would allow you to infer the conclusion? Insert such sentences into your proof toward the bottom, listing the rules, then try to go back and prove these intermediate steps.)

(On p. 173 of the book in the “Remember” box they present a slightly more elaborate method for how to tackle an argument [either to prove it as valid or to show by counterexample that it is invalid]. Be sure you understand the reasoning behind each step of the method, and go back and reread the preceding pages of the text if you don't.)

### POWERPOINT SLIDES #14 - #23

Work step-by-step through the proof of another DeMorgan Law (from p. 171).

\*\*\* STUDENTS, BE SURE THAT YOU TACKLE THE OTHER HOMEWORK PROOFS FROM THIS WEEK: **Proofs 6.18-6.20** and **6.28-6.30** (these latter three are harder). I have thrown you a bone, so to speak, and posted on Blackboard an **answer key file for lesson 14** with the answers to proofs **6.19** and **6.30**. To continue developing your skills with working proofs, you should try to tackle *all* the homework problems, however, not just the ones I post answers for.