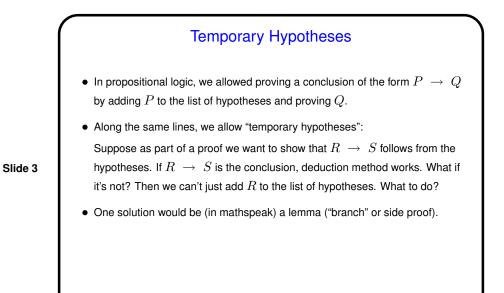


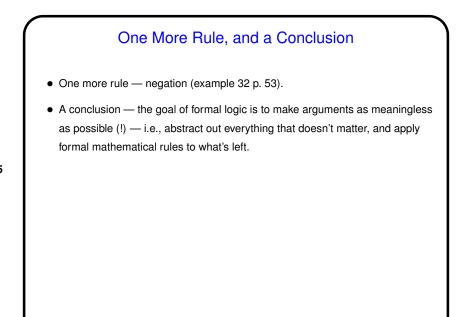
Predicate Logic, Recap / What Next?
Now we have a set of derivation rules for predicate logic (we'll add a few more for convenience later).
As with propositional logic, we could show that these rules are "sound" (if we can prove something, it's true/valid) and "complete" (if something is true/valid, we can prove it).
Examples: Section 1.4 problems 7 and 9.

Slide 2



**Constitution is basically an inline lemma:** - Introduce "temporary hypothesis" T. - Derive some more steps from earlier results and T, ending with S. - Conclude that  $T \rightarrow S$ . Note that the formulas we derive from earlier steps and T might depend on T, so — indent to make it clear that they're not part of the main proof. • Example — section 1.4 problem 21.

Slide 4



Slide 5

Slide 6

## **Winute Essay** • Use predicate logic to prove that the following argument is valid: "All CS majors must take Discrete Structures. Some CS majors are also physics majors. Therefore, some physics majors must take Discrete Structures." Use predicates C(x), D(x), and P(x).