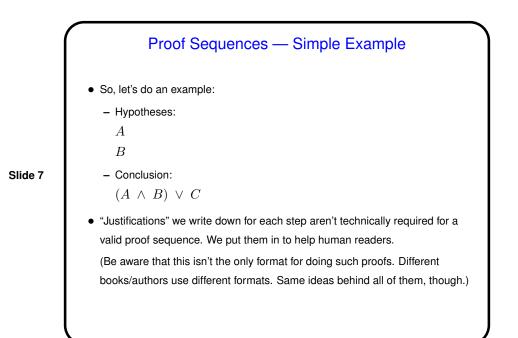


	Building Blocks for Proof Sequences
•	Equivalence rules (two-way), p. 23. Notice that these <i>can</i> be applied to parts of wffs.
	Example: "Implication" says that if we have $P \to Q$ we can replace it with $P' ~\vee~ Q$ , or vice versa.
•	Inference rules (one-way), p. 24. Notice that these <i>cannot</i> be applied to parts of wffs.
	Example: "Modus ponens" says if we have $P \to {\rm Q}$ on one line, and $P$ on another, we can write down a new line $Q.$
•	"Deduction method": To show that $P_1, P_2, \ldots P_n$ guarantee conclusion $R \to Q$ , we can show that $P_1, P_2, \ldots P_n, R$ guarantee $Q$
•	Derived inference rules, p. 31. Notice that many of these are proved as problems, and you should only use them for later problems. (E.g., okay to use the results of problem 23 in problem 25, but not vice versa.)



Hints for Constructing Proof Sequences • Two things involved in constructing proofs: • Applying the rules correctly — not so difficult, if you correctly match up your formula with the rule. • Knowing which rule to apply — more difficult, gets a little easier with practice. Also see hints ("heuristics") on p. 26: \* Consider using modus ponens often. \* Consider using De Morgan's laws to simplify (?)  $(P \lor Q)'$ ,  $(P \land Q)'$ . \* Consider using equivalence rules to convert  $P \lor Q$  to  $P' \rightarrow Q$ . Sometimes helps to "work backward" — figure out an intermediate result from which you could reach the conclusion, then figure out how to get the intermediate result. If you do this, though, must still construct proof "going forward".

