

Slide 1

Administrivia

- Reminder: Homework 2 due Friday.

Slide 2

Minute Essay From Last Lecture

- None. Should we look at solutions to problems? (Section 1.4 problems 16, 20, 24, 28, 30.)

Proof Techniques

Slide 3

- In chapter 1 we worked up a formal system for proving “meaningless” formulas — which can prove “meaningful” formulas as special cases.
- Most of the time, though, we want to prove something is valid in a particular context, and the procedure is less formal and makes use of context-specific additional info (e.g., definitions of terms such as “even integer”).
- *But* keep in mind that less-formal proofs could be done in the millimeter-by-millimeter style of chapter 1.
- (Why are we doing this anyway? Because you almost surely will see theorems/proofs in CS theory classes.)

Proof Techniques, Continued

Slide 4

- Suppose you have a “conjecture” (e.g., “all odd numbers greater than 1 are prime”). How to (try to) prove it?
- Well, first must sometimes decide *whether* to prove it. Do you think it’s true?
- If it’s a statement about all integers, etc., often helpful to start with “inductive reasoning” — try some examples and see what happens.
- If one doesn’t work? “Counterexample” that shows conjecture false.
- If all succeed? Just means you didn’t find a counterexample. So, turn to “deductive reasoning” to prove — subject of first part of chapter 2.
- Lots of examples/problems will be simple stuff about integers. Why? Something where we supposedly all know the “context”.

Minute Essay

- Have you been asked to do proofs in a math (or other) course before? What course? Did you find it easy/hard? fun/painful?

Slide 5