

## Recommended problems 2 — CS3512 — Fall '09

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If you're feeling a little shaky about what we've done so far, there are plenty of proofs to try, as described in the last set of problems. Please email me with questions – the more precise, the better. (Often the attempt to make a question precise will answer the question, or at least prepare you to appreciate the answer.) In order to do well in this course, you need to be able to understand and write proofs, so don't wait to get started on this!

Repeat of some general tips: choose a proof structure suitable for the claim you are proving, make the plan of your proof clear, make your proof checkable line-by-line. (And make sure it is clear where your variables come from.)

Soon, you should be *able* to do all the textbook exercises for Section 1.2, except for 13, 14, 24–26, 33d (which concern definitions or approaches we will skip). ((In 2nd ed, the similar problems to ignore are 12, 13, 19–21, 28d.)) As usual, look them over and do as many as you need. (You can start by checking yourself against the problems answered in the back of the book. If you have questions about other problems from the book, please send email or otherwise ask.)

As usual, there are also questions raised in lecture notes (and left for you to answer). Worth considering.

### Additional problems

- 1 For all  $n \in \mathcal{N}$ , let  $A_n = \{i \mid i \in \mathcal{N}, i \leq n\}$ .
  - a) True or False? For all  $n \in \mathcal{N}$ ,  $n \in A_n$ .
  - b) True or False? There is an  $n \in \mathcal{N}$  s.t.  $A_n = \emptyset$ .
  - c) True or False? There is an  $n \in \mathcal{N}$  s.t.  $A_n = \mathcal{N}$ .
  - d) True or False? For all  $m, n \in \mathcal{N}$ , if  $m \leq n$ , then  $A_m \subset A_n$ .
  - e) True or False? For all  $m \in \mathcal{N}$ , there is an  $n \in \mathcal{N}$  s.t.  $m \notin A_n$ .
  - f) True or False? For all  $m, n \in \mathcal{N}$ , if  $m \in A_n$ , then  $\text{power}(A_m) \subset \text{power}(A_n)$ .