HOMEWORK 7
DISCRETE MATHEMATICS I
DUE 02-12

Show your work!

(1) Which of the following forms of argument are valid? For each *valid* argument, explain its validity informally, in words. For each *invalid* form, give an example where the premises are true but the conclusion is false.
   (a) All X are Y. All Y are Z. Therefore, all X are Z.
   (b) Some X are Y. Some Y are Z. Therefore, some X are Z.
   (c) Some X are Y. All Y are Z. Therefore, some X are Z.
   (d) No X are Y. All Y are Z. Therefore, no X are Z.

(2) Lewis Carroll believed that the following argument was valid: "All philosophers are logical. All illogical people are obstinate. Therefore, some obstinate persons are not philosophers."
   (a) Show, by changing the topic of this argument without changing the form, that it is invalid. (HINT: This has to do with vacuous statements.)
   (b) What third premise could be added to make this argument valid? (HINT: There is more than one answer. Probably the most conservative approach is to add a "~~Some X are Y~~" "There is an X" statement to rule out the universe of discourse being empty.)

- **Seven** book problems: #1.4.1, 2, 13, 17, 20, 24, 25.