MATH 1090.03D

Fall 2000

▶ Date posted: Nov. 20, 2000

▶ Due: **TBA by Web announcement immediately following the end of the CUPE strike.**

Alternative Problem Set No. 4—On Chapters 3, 4 and 9 of "GS". See also our "Web–Ch.1, and "Basic Equational Logic" report (on the Web).

This problem set is an **alternative** set to the one collected today (Nov. 20, 2000).

It is **ONLY FOR THOSE students who exercised their right of choice** not to cross the picket lines, and therefore did not attend classes during the strike.

Only **ONE** problem set #4 will be accepted. Please **ignore this problem set IFF you have already handed in the original problem set #4.**

In the following problems you are **expected** to use the Deduction Theorem to your "**full advantage**".

Do *not* use the Tautology theorem, but you can use all the other "tools" we have learned (e.g., modus ponens, cut, combine/split hypotheses—that is, "$A, B, C \vdash D$ iff $A \land B \land C \vdash D$"—resolution, etc.)

You should remember (and use when appropriate) the following fact from class:

$$A \equiv B \vdash A \Rightarrow B \text{ and } A \equiv B \vdash B \Rightarrow A$$

and

$$A \Rightarrow B, B \Rightarrow A \vdash A \equiv B$$

which means that to prove $\Gamma \vdash A \equiv B$ you can do so by proving two things: $\Gamma \vdash A \Rightarrow B$ and $\Gamma \vdash B \Rightarrow A$.

- Do the following problems from the text, Chapter 3.

  p.66, problems 3.76, 3.77, 3.78, 3.79, 3.80, and 3.81.

  For the following use a combination of Deduction Theorem and cut-rule:

- p.122, problems 6.3, 6.4, 6.6.

  The following are on Predicate Calculus:

- Problems 9.4, 9.6, 9.10.