MATH 1090.03

Winter 2000

Date: Jan. 20, 2000
Due: Feb. 3, 2000—**At the beginning of class**

Problem Set No. 2

NOTE. When the book asks you to "prove valid"—or "prove the validity" of—a formula, it wants you to prove that said formula is a *tautology*.

BE-operator precedences continue to be **as given in class**. In particular, all associativities are **right**.

Axiom (schemata) and rules of inference are **exactly those given in class**†. In particular, we have **no "Substitution Rule of Inference"** (those who attend classes will know that the preceding comment does not contradict the fact that we express "Leibniz" via the substitution *operation*).

Please write and annotate your proofs in the equational style of the text.

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

  3.2, 3.5, 3.8, 3.9, 3.12, 3.18, 3.19, 3.20, 3.27, 3.28, 3.29, 3.47, 3.66

Hint. Ignore the hints!

- (One more problem, because "13" is bad luck.) Something we mentioned in class, but did not "check": Prove by induction on A, that for any formulas A and B and any variable q, $A[q := B]$ is also a formula.

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† You will recall that we have made a number of small changes to the text's exposition in Chapter 3.