CS486: Spring 1999

Problem Set 6:

Due Thursday, March 11, 1999

Reading:

Please read Smullyan, pp. 56–65. Read the exercise on page 63 for Tuesday March 9.

Exercises

Please submit each homework problem on a separate piece of paper.

1. Prove using tableau where C is a closed formula.

(i) $(\forall x)[Px \supset C] \equiv ((\exists x)Px) \supset C$

(ii) $(\exists x)[Px \supset C] \equiv ((\forall x)Px) \supset C$

2. Solve the first exercise on page 57, $(H \wedge K) \supset L$ using Gentzen sequents.

3. Abstract this statement to the first order logic. Is it valid there?

> If t is a finitely branching tree, *FinBTree(t)*, and if t is infinite, *Inf(t)*, then there is a branch b in t, *Branch(b, t)*, such that for every number n, *Num(n)*, there is a node of b of depth n, *Depth(b, n)*. Hence if there is a number m such that no branch of t has depth m, then t is not infinite.