

CS 81 Assignment 4 for Wed., Feb. 16

1. Give a natural deduction proof of the following, based on the Group Theory axioms given in class:

$$(\forall x) (i(i(x)) = x)$$

(Here i is the “inverse” function.)

2. Give a natural deduction proof of the following, based on the Number Theory axioms given in class, using the *rule* form of induction, rather than the axiom form:

$$(\forall x) (\forall y) (\forall z) (x+(y+z)) = ((x+y) + z)$$

3. Hein page 415 Exercise 10.b.
4. Hein page 415 Exercise 11.d, with the added restriction that the l.h.s. of the implication must be true in the model.
5. Hein page 415 Exercise 12.e, with the added restriction that the l.h.s. of the implication must be true in the model.
6. Hein page 415 Exercise 14.b.
7. Hein page 415 Exercise 14.c.
8. Hein page 416 Exercise 16.g.
9. Hein page 416 Exercise 19.
10. Bonus (Extra credit): Give a natural deduction proof of formula 7.6 on Hein page 420.