

## Math 310 Homework 2, Due Sept. 19, 2008

In the following problems, you can only use the original version of the axioms of Peano.

(1) Prove that for every natural number  $m \neq 1$ , there is one and only one natural number  $q$  such that  $m = q'$ . (10 points)

(2) Prove that  $n' \neq n$  for every natural number  $n$ . (10 points)

(3) Prove that  $m + n \neq n$  for every pair  $m, n$  of natural numbers. (10 points)

(4) Prove that if  $m$  and  $n$  are natural numbers then  $m + n \neq 1$ . (10 points)

(5) If  $m \neq n$ , prove that  $m + p \neq n + p$ , where  $m, n$ , and  $p$  are natural numbers. (10 points)