

## HOMWORK ASSIGNMENT NO. 4

DATE: NOVEMBER 3, 2009 DUE: NOVEMBER 17, 2009

Each of the following statements are either true or false. If the statement is true then explain why it is true. If the statement is false, then explain why it is false.

- (1) For every  $n \in \mathbb{N}$ ,  $n^2 - n + 11$  is prime.
- (2) For every nonnegative integer  $n$ , there exists a nonnegative integer  $k$  such that  $k < n$ .
- (3) For every nonnegative integer  $n$ , there exists a nonnegative integer  $k$  such that  $k > n$ .
- (4) If  $x$  and  $y$  are real numbers  $|x + y| = |x| + |y|$ .
- (5) If  $x$  is a real number such that  $|x + 1| + |x - 1| \leq 1$ , then  $|x^2 - 1| \leq 1$ .
- (6) There exists a real number  $x$  such that  $x^2 < x < x^3$ .
- (7) Let  $a, b, c \in \mathbb{Z}$ , if  $ab, ac, bc$  are all even,  $a, b, c$  are even.