

### NUMBER THEORY: HOMEWORK 3

The problems in this homework could appear in the coming midterm on Tuesday. You should try them. But you don't have to hand it in until Friday September 26.

Homework due on Friday September 26.

#### 1. PROBLEMS

- 1) Show there are infinitely many prime of the form  $6n + 5$ .
- 2) Using the Fermat factorization method, factor each of the following integers.
  - a) 143
  - b) 46009
  - c) 3,200,399.
- 3) Proof that if  $2^n$  is prime  $\geq 5$  then  $n = 2^k$  for some positive integer  $k$ .

Also do the problems 17 and 20 section 3.6 page 132 in the book.