

Number Theory: Home Work 1.

Name:

ID:

Solutions should be submitted on Wednesday March 24th at 12:15.

Exercise 1. Let $p \geq 5$ and $q \geq 5$ be two primes, prove that $24|p^2 - q^2$.

Exercise 2. (a) Given that p is a prime and that $p|a^n$. Prove that $p^n|a^n$.

(b) Assume that $\gcd(a, b) = p$ a prime number, what are the possible values of $\gcd(a^2, b^2)$ and $\gcd(a^2, b)$.

Exercise 3. Use the sieve of Eratosthenes to determine all the primes between 100 and 200.

Exercise 4. A company of 20 persons, men, women and children entered to the zoo paying a total of 20 Dollars. Each man paid 3 dollars, each woman 2 Dollars and each child 0.5 Dollar. Find the number of men, woman and children.
