Exam 1 **Number Theory** **02–04–2015**

1. Prove: $12 \mid n^4 - n^2$ for any integer n.

2. Find all the integer solutions to the linear equation $95x + 342y = 76$.

3. Is the number 313 prime or composite? Use trial division.

4. Evaluate $\gcd(21000, 50400)$ using prime factorization.

5. Factor the number $n = 4717$ using the Fermat factorization technique.

6. Find a complete residue system (CRS) modulo 7 using prime numbers.

7. Find all the integers that are inverse of 19 mod 89.

–Amin Witno

The list of primes below 200.

2	3	5	7	11	13	17	19	23	29
31	37	41	43	47	53	59	61	67	71
73	79	83	89	97	101	103	107	109	113
127	131	137	139	149	151	157	163	167	173
179	181	191	193	197	199				