Philadelphia University

Department of Basic Sciences

Exam 1 **Number Theory** **12–11–2013**

Solutions must be complete in order to receive full credit.

1. Evaluate $\gcd(2013, 1113)$.
2. Solve the linear equation $69x + 27y = 15$.
3. Prove that $12 \mid n^4 - n^2$ for any integer n.
4. Is the number 319 prime or composite? Use trial division.
5. Evaluate $\gcd(10500, 392)$ by factoring into prime numbers.
6. Find a complete residue system (CRS) modulo 7 consisting of prime numbers.
7. Find all the integers x such that $x \equiv 7^{-1} \pmod{11}$

–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				