PHILADELPHIA UNIVERSITY

DEPARTMENT OF BASIC SCIENCES

Exam 1 **Number Theory** **18–11–2014**

Solutions must be complete in order to receive full credit.

1. Evaluate $\gcd(14400, 828)$ by the Euclidean algorithm.

2. Eva;uate $\gcd(14400, 828)$ using prime factorization.

3. Find all the integer solutions to the linear equation $126x + 90y = 54$.

4. Prove that if $d \mid mn$ and $\gcd(d, m) = 1$, then $d \mid n$.

5. Prove that the number 293 is prime using trial division.

6. Factor the number $n = 4331$ using the Fermat factorization technique.

7. Find a complete residue system (CRS) modulo 11 using only prime numbers.

–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				