

PHILADELPHIA UNIVERSITY
DEPARTMENT OF BASIC SCIENCES

Exam 1

Number Theory

31-03-2008

Solutions must be complete in order to receive full credit.

1. Find a and b such that $\gcd(228, 593) = 228a + 593b$.
2. Find all the solutions to $30x + 18y = 66$.
3. Determine 667 is prime or composite, using trial division.
4. Evaluate $\gcd(60000, 3300)$ by factoring into primes.
5. (a) Prove that if $\gcd(n, 12) = 1$ then $n = 12k + a$, where $a = 1, 5, 7$, or 11 .
(b) Prove that if $\gcd(n, 12) = 1$ then $12 \mid (n^2 - 1)$.

-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				