

PHILADELPHIA UNIVERSITY
DEPARTMENT OF BASIC SCIENCES

Exam 1

Number Theory

30-03-2010

Solutions must be complete in order to receive full credit.

1. Solve the linear equation $162x + 711y = 99$.
2. Compute $100! \% 103$. The number 103 is prime.
3. Solve the system of congruences.

$$x \equiv 7 \pmod{11}$$

$$x \equiv 5 \pmod{8}$$

$$x \equiv 4 \pmod{5}$$

4. Suppose that S is a complete residue system mod 9. Prove that $S' = \{4x \mid x \in S\}$ is also a complete residue system mod 9.

-Amin Witno