MATH 406 – HOMEWORK IV

(due Wednesday 25 February 2009)

1. Find all integer solutions to $25x + 95y = 70$.

2. Section 3.7, Exercise 6, p. 138.

3. Show that if a, b and c are integers with $c > 0$ such that $a \equiv b \pmod{c}$, then $(a, c) = (b, c)$.

4. Show that if $a^2 \equiv b^2 \pmod{p}$ where p is prime then either $a \equiv b \pmod{p}$ or $a \equiv -b \pmod{p}$.

5. Use induction to show that $4^n \equiv 1 + 3n \pmod{9}$ for all positive integers n.

NOTE: Explain your work clearly. Your solutions must include enough detail to justify your conclusions.