MATH 406 – HOMEWORK III

(due Wednesday 18 February 2009)

1. Show that every integer $n > 11$ can be written as the sum of two composite integers.

2. Assume that a, b are relatively prime positive integers. Show that $(a^2 + b^2, a + b)$ is either 1 or 2.

3. Show that if k is a positive integer, then $3k + 2$ and $5k + 3$ are relatively prime.

4. Use the Euclidean Algorithm to find $(981, 1234)$ and express this as a linear combination of 981 and 1234.

5. Let a and b be positive integers. Show that there are positive integers c and d such that $c|a$, $d|b$, $cd = [a, b]$, and $(c, d) = 1$.

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