ASSIGNMENT 4

ECE 103 (Spring 2009)

Due in tutorial on Monday, June 8.

1. Let $a, b, c \in \mathbb{Z}$. Prove that $\text{GCD}(a, c) = \text{GCD}(b, c) = 1$ if and only if $\text{GCD}(ab, c) = 1$.

2. Which of the following linear Diophantine equations have solutions? In each case, explain why the equation does or does not have solutions.

   (a) $28x + 91y = 40$

   (b) $1331x + 1001y = 33$

   (c) $12345678x + 12345679y = 3$

3. (a) Find the complete solution to the linear Diophantine equation $133x + 315y = 14000$.

   (b) Find all non-negative integer solutions to the equation $133x + 315y = 14000$.