Homework on Congruences

October 11, 2009

1. Using the Euclidean algorithm, solve the congruence

$$44x \equiv 713 \pmod{2861},$$

by finding an integer x that satisfies it in the range $\{0, 1, 2, ..., 2860\}$.

2. Show that 7 cannot divide any number of the form $x^3 + y^3 + 3$, where x and y are integers.

3. Determine all integers $n = pq$, where p and q are primes such that

$$\varphi(n) = 24.$$