Math 290-Number Theory for Teachers
Problem of the Day #12
Due Monday, February 24, 2014

1. How many different solutions are there to the following congruences? (Count only inequivalent solutions in the modulus. That is, count only solutions that are between 0 and $m-1$.)

(a) $3x \equiv 3 \mod 6$
(b) $3x \equiv 1 \mod 6$
(c) $4x \equiv 2 \mod 6$
(d) $4x \equiv 5 \mod 6$
(e) $5x \equiv 1 \mod 6$
(f) $5x \equiv 3 \mod 6$
(g) $2x \equiv 1 \mod 7$
(h) $3x \equiv 4 \mod 7$

2. Can you predict how many solutions there are to $ax \equiv b \mod m$? (Hint: look at (a, m).)