Amanda Ennis **Homework 4** **Due 09-26-2014**

1. Decpipher the message:

   MKPG JAIW LJ

   knowing it was encoded with an affine cipher with key $a = 11$ and $b = 10$.

2. Suppose $d = \gcd(13813, 78280)$.

   (a) Find d

   (b) Find k, l such that $d = 13813 \cdot k + 78280 \cdot l$.

3. For each of the following find $a^{-1} \pmod{m}$ or explain why no such inverse exists. That is, find c such that $ac \equiv 1 \pmod{m}$.

   (a) $a = 3056, m = 165227$

   (b) $a = 35485, m = 2376273$.

4. (Wait until Wednesday) Find $\phi(1453500)$

5. (a) Get a picture of you with Globalization RA, PA (other than CaroLynn) or professor (other than me).

   (b) Get a picture of a place to buy food on campus that you have never bought food at.