

1. Suppose $d = \gcd(20058, 50040)$.
 - (a) Find d
 - (b) Find k, l such that $d = 20058 \cdot k + 50040 \cdot l$.
2. 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) $a = 171823, m = 2978218$
 - (b) $a = 292520, m = 29749$.
3. Decipher the message:

ORMQ SOOS CRV

knowing it was encoded with an affine cipher with key $a = 7$ and $b = 18$.
4. (Wait until Wednesday) Break the message:

DOTR OTTO DOTC MZXG UWXO DMZG

knowing it was encoded with an affine cipher and contains the word(s) "no longer".
5. (Wait until Wednesday) Find $\phi(67500)$
6.
 - (a) Get a picture of you with Natural World RA, PA (other than JuliAnne) or professor (other than me).
 - (b) Get a picture of a place to buy food on campus that you have never bought food at.