## Supplement for Problem Set #4

This problem involves the Hill cipher with key  $k = \begin{bmatrix} 1 & 12 & 9 \\ 5 & 7 & 13 \\ 19 & 12 & 16 \end{bmatrix}$ .

You will need to do some research to understand how the cipher works. In this implementation, you can pad the plaintext with 'X' if necessary.

1. Encrypt the message

"Clam chowder is just hot ocean milk with animal croutons"

This is from the show *The Good Place*, if you are wondering.

Feel free to use *Mathematica* for matrix multiplication or other grunt work if you want.

2. You receive the encrypted message

SZQ IME XGN JOP HML NEH RYW YDE JQM GJW ECI JUH IKI

Decrypt the message. Who sent the message? Tell me something interesting about this person.

There are online tools online you can use to find the inverse of a matrix mod 26, and feel free to use *Mathematica* for any matrix multiplication. And, of course, cite any tool you use in your writeup.