

**MATH 295A/395A: CRYPTOGRAPHY  
HOMEWORK #1**

PROBLEMS

**Problem 1.** What is the message embedded in the following?

Dear George,  
Greetings to all at Oxford. Many thanks for your letter and for the Summer examination package. All Entry Forms and Fees Forms should be ready for final despatch to the syndicate by Friday 20th or at the very latest, I'm told, by the 21st. Admin has improved here, though there's room for improvement still; just give us all two or three more years and we'll really show you! Please don't let these wretched 16+ proposals destroy your basic O and A pattern. Certainly this sort of change, if implemented immediately, would bring chaos.

**Problem 2.** In one of Dorothy Sayers' mysteries, Lord Peter is confronted with the following message:

I thought to see the fairies in the fields, but I saw only the evil elephants with their black backs. Woe! how that sight awed me! The elves danced all around and about while I heard voices calling clearly. Ah! how I tried to see--throw off the ugly cloud--but no blind eye of a mortal was permitted to spy them. So then came minstrels, having gold trumpets, harps and drums. These played very loudly beside me, breaking that spell. So the dream vanished, whereat I thanked Heaven. I shed many tears before the thin moon rose up, frail and faint as a sickle of straw. Now though the Enchanter gnash his teeth vainly, yet shall he return as the spring returns. Oh, wretched man! Hell gapes, Erebus now lies open. The mouths of Death wait on thy end.

He also discovers the key to the message, which is a sequence of integers:

7876565434321123434565678788787656543432112343456567878878765654433211234

Decrypt the message. [*Hint: What is the largest integer value?*]

**Problem 3.** *In one of his cases, Sherlock Holmes was confronted with the following message:*

534 C2 13 127 36 31 4 7 21 41  
DOUGLAS 109 293 5 37 BIRLSTONE  
26 BIRLSTONE 9 127 171

*Although Watson was puzzled, Holmes was able immediately to deduce the type of cipher.  
Can you?*