Problem Set 1
Due: 9:00 a.m. on Wednesday, January 20

Instructions: Carefully read Sections 1.1 and 1.6 of the textbook. Graduate students should submit solutions to all of the following problems and undergraduate students should submit solutions to only those marked with a "U". A subset of the problems will be graded. Be sure to adhere to the expectations outlined on the sheet *Guidelines for Problem Sets.* Submit your solutions in-class or to Dr. Cooper's mailbox in the Department of Mathematics.

Exercises: From pages 47–59 of the textbook.

1U. Section 1.1 #1.3, page 48

2U. Section 1.6 #1.40, page 56

3U. Section 1.6 #1.41, pages 56–57

4. Suppose that you have an alphabet with n letters. A letter in the alphabet is said to be *fixed* if the encryption of the letter is the letter itself. How many simple substitution ciphers are there if no letters are left fixed and

   (i) $n = 2$
   (ii) $n = 3$
   (iii) $n = 4$?