

## Math 2001: Homework P7

Due: October 30, 2013

1. From the book do problems:
  - 1.3: 4, 7
  - 4.2: 4, 7, 8 (Note you may leave answers in terms of binomial coefficients).
2. The genetic code can be viewed as a sequence of four letters  $T$ ,  $A$ ,  $G$ , and  $C$ .
  - (a) How many 6-letter sequences are there?
  - (b) How many 6-letter sequences are palindromic (the same when read in the reverse order)?
3. How many ways can 6 men and 6 women be seated at a table with 12 place settings such that gender alternates as one goes around the table?
4. Suppose one has  $\ell$  tasks, and suppose for  $1 \leq j \leq \ell$  task  $j$  has  $m_j$  different ways of being completed. Use induction to show that the total number of ways to complete a sequence these  $\ell$  tasks is  $m_1 m_2 \cdots m_\ell$ .