Math 477 REAL QUIZ #8

NAME: (print!) _____

E-MAIL ADDRESS: (print!) _____

1. (4 points) In a certain community, the probability that a family has i boys and j girls is given by

$$p(i,j) = \begin{cases} \frac{c}{2\,i+3\,j+1} & , \quad if \quad 0 \le i \le 1 \quad and \quad 0 \le j \le 1; \\ 0 & , \quad otherwise. \end{cases},$$

for some positive constant c (that would make it a discrete probability mass function). Calculate the conditional probability mass function for the number of boys in families that have exactly one girl.

2. (6 points) Using the linearity of expectation, find the average number of places $1 \le i \le n$ satisfying $\pi(i) \in \{i, i+1\}$ taken over all permutations of length n.