MATH 2610
Discrete Mathematics for Computer Science
Makeup Credit

Below are two problems. Each are worth a maximum of 5 points which will be added to your last test grade. I expect combinatorial proofs for each problem. Please contact me if you are unsure what this means! These problems will be due Next Wednesday April 20, 2005 at the beginning of class. You should feel free to work with others and ask me any questions you may have. I expect for you to write up your own solutions. Please write them neatly. If this means you do some work solving the problems and then write up your solutions again, then you should do this.

(1) Suppose n is a positive integer. Give a combinatorial proof of the following equality.

$$\binom{2n}{2} = 2\binom{n}{2} + n^2.$$

(2) Suppose m and n are positive integers. Give a combinatorial proof of the following equality.

$$(m+1)^n = \sum_{k=0}^{n} \binom{n}{k} m^k$$