CECS 228 Name:

Lab 11.1 ID: Date:  
Objective:

* Be able to apply the Binomial Theorem
* Be able to use Pigeonhole Principle
* Be able to use Inclusion-Exclusion Principle

Exercise 1:   
a. Find the coefficient of x6 in (2x2 + 3)6.  
  
  
  
b. Find the expansion of (x + y)4

c. Prove the following identity Show that if n is a positive integer, then

Exercise 2: What is the coefficient of x101y99 in the expansion of (2x − 3y)200?

Exercise 3: A bowl contains 10 red balls and 10 blue balls. A woman selects balls at random without looking at them.

a) How many balls must she select to be sure of having at least three balls of the same color?

b) How many balls must she select to be sure of having at least three blue balls?

Exercise 4:  
Suppose that there are nine students in a discrete mathematics class at a small college.

a) Show that the class must have at least five male students or at least five female students.

b) Show that the class must have at least three male students or at least seven female students.

Exercise 5: In a survey of 270 college students, it is found that 64 like brussels sprouts, 94 like broccoli, 58 like cauliflower, 26 like both brussels sprouts and broccoli, 28 like both brussels

sprouts and cauliflower, 22 like both broccoli and cauliflower, and 14 like all three vegetables. How many of the 270 students do not like any of these vegetables?