

Math 204- Discrete Mathematics, Spring 2010

Quiz 6, May 03, 2010, 17:40 group

Time: 25 minutes

Write your solutions clearly, provide explanation, etc.

Do not forget to write your name and ID No on top of the page!

Problem 1 (6+6+2 pts).

a. For integers $1 \leq k \leq n$, show that

$$\binom{n+2}{k+1} - 2\binom{n+1}{k+1} + \binom{n}{k+1} = \binom{n}{k-1}$$

b. What is the coefficient of x^4y^3 in the expansion of $(3x + 2y)^7$?

c. What is the coefficient of x^3y^2 in the expansion of $(3x + 2y)^7$?

Problem 2 (2 pts each). Using the numbers $1, 2, \dots, 9$, how many vectors of length 6 can be formed in each of the following cases?

a. vector starts with an even number and ends with an odd number,

b. vector starts with 5 or 7,

c. vector starts with an even number or ends with an odd number.