

Discrete Mathematics, 2016 Fall - Worksheet 9

October 4, 2016

Instructor: Zsolt Pajor-Gyulai, CIMS

In all of the above problems explain your answer in full English sentences.

1. Evaluate $\binom{3}{2}$ and $\binom{2}{3}$ by explicitly listing all possible multisets of the appropriate size.
2. Evaluate the following special values
 - (a) $\binom{0}{n}$
 - (b) $\binom{n}{0}$
 - (c) $\binom{0}{0}$
3. What multiset is encoded by the stars-and-bars notation $*|||* **$? What set are the elements taken from?
4. There are four large groups of people, each with 1000 members. Any two of these groups have 100 members in common. Any three of these groups have 10 members in common. There is 1 person in all four groups. All together, how many people are in these groups?
5. The number of length-6 lists whose elements are chosen from the set $\{1, 2, 3, 4, 5\}$ is 5^6 . How many of these use all of the elements in $\{1, 2, 3, 4, 5\}$?