

Homework 4: Permutations and Combinations of Multisets

1. Brualdi, Chapter 3, #23.
2. Brualdi, Chapter 3, #26.
3. How many rearrangements of the letters of the word “MISSISSIPPI” have two (or more) adjacent I’s?
4. How many ways can 30 cans of Coke be distributed among 5 people
 - (a) if it is possible that some of the people receive 0 cans?
 - (b) if each person must receive at least 1 can?
 - (c) if a certain two of the people must receive at least 3 cans, and the other three people must receive at least 1 can?
 - (d) if each person must receive exactly 6 cans?
5. How many ways can 30 cans of soda, each a different brand, be distributed among 5 people, if each person must receive exactly 6 cans?
6. A corner store sells four different types of soda, and has available 10 cans of each type. How many ways can a person select 8 cans for purchase?
7. Let $A = \{1, 2, 3, \dots, 8\}$ and $B = \{1, 2, 3, \dots, 13\}$. A function f from A to B is said to be *weakly increasing* if $a < b$ implies $f(a) \leq f(b)$, or in other words, if $f(1) \leq f(2) \leq \dots \leq f(8)$. Determine the number of weakly increasing functions from A to B .

Challenge problems (students enrolled in Math 6670 should turn in (8 or 9) and (10 or 11 or 12)).

8. Brualdi, Chapter 3, #22.
9. Brualdi, Chapter 3, #24.
10. Brualdi, Chapter 3, #47.
11. Brualdi, Chapter 3, #54.
12. Determine the number of permutations of the multiset $\{8 \cdot a, 34 \cdot b\}$ for which there are at least 2 b ’s between any two a ’s.