

Homework 9

Section 6.3

4. Let $S = \{1, 2, 3, 4\}$.
 - (a) List all the 3-permutations of S.
 - (b) List all the 3-combinations of S.

10. There are six different candidates for governor of a state. In how many different orders can the names of the candidates be printed on a ballot?

12. How many bit strings of length 12 contain
 - (a) exactly three 1s?
 - (b) at most three 1s?
 - (c) at least three 1s?
 - (d) an equal number of 0s and 1s?

18. A coin is flipped eight times where each flip comes up either heads or tails. How many possible outcomes
 - (a) are there in total?
 - (b) contain exactly three heads?
 - (c) contain at least three heads?
 - (d) contain the same number of heads and tails?

22. How many permutations of the letters ABCDEFGH contain
 - (a) the string ED?
 - (b) the string CDE?
 - (c) the strings BA and FGH ?
 - (d) the strings AB, DE, and GH?
 - (e) the strings CAB and BED?
 - (f) the strings BCA and ABF ?

Section 6.4

2. Find the expansion of $(x + y)^5$
 - (a) using combinatorial reasoning, as in Example 1.
 - (b) using the binomial theorem.
4. Find the coefficient of x^5y^8 in $(x + y)^{13}$.
8. What is the coefficient of x^8y^9 in $(3x + 2y)^{17}$?
23. Prove the identity $\binom{n}{r}\binom{r}{k} = \binom{n}{k}\binom{n-k}{r-k}$ whenever n , r , and k are nonnegative integers with $r \leq n$ and $k \leq r$,
 - (a) using a combinatorial argument.
 - (b) using an argument based on the formula for the number of r -combinations of a set with n elements.