Exercises

Exercise 1. In a regular deck of 52 cards (two red and two black suits; 9 number and 4 picture cards in each suit), how many cards are:
(a) red,
(b) numbers,
(c) red and numbers,
(d) red or numbers (or both),
(e) either red or numbers (but not both)?
The goal is to use the techniques from the lecture instead of direct counting.

Exercise 2. A regular 6-sided die is thrown 5 times and the results are summed. How many ways to get an even number as the total?

Exercise 3. A wedding photographer is taking pictures of a party consisting of the bride, the groom, the bride's parents and the groom's parents (six people in total). How many ways to arrange the group so that the newlyweds are:
(a) standing together,
(b) separated by at leats one other person?

Exercise 4. How many ways for a club with n members to elect an m-member board where one of the board members is designated as the president and the rest are vice-presidents?

Exercise 5. How many ways to distribute m identical candies among n kids so that each kid gets at least one candy?