# Selected Problems

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# 1 Midterm 2017

## 1.1 Problem 4 a

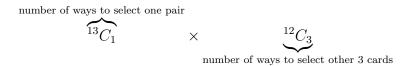
**Example 1.1.** From a deck of 52 cards, a 5-card hand is dealt. Find the number of hands containing exactly one pair without considering the variation of the suits?

#### 1.1.1 Answer

Without considering the suits, my approach would be:

The pair can be one of 13 numbers, i.e. we need to pick 1 out of 13 candidates.

For the remaining 3 cards,3 cards with different numbers. In this case we need to pick 3 out of 12 candidates.



## 1.2 Problem 3 b

**Example 1.2.** In how many ways can we distribute 9 identical picses of candy to four children, if each child must get at least one piece?

#### 1.2.1 Answer

The first four candies will be distributed to the children. Now we have 5 candies to be distributed to the children Imagine 3 divisors (or blocks) we will use to group the candies, for each arrangement of the divisors and candies is a distribution. Now we have 8! arrangement but removing the duplicates for the candies 5! and 3! for the divisors

$$\frac{8!}{5!.3!}$$