

HOMEWORK 1 (MATH 184, WINTER 2017)

Read: Bona (Second ed.), sections 1.1-4, 2.3-4, 3.1-2, and 4.4.

Solve: Exc 3, 4, 17a in §1.10, 18, 19, 20, 22, 23 in §2.10, 11, 12 in §3.10, 13, 14, 23, 25 in §4.10, and the following problems:

I. Consider a jar with 40 red, 40 green and 80 black m&m chocolates. Choose randomly 20 of them. Compute:

- a) probability that no red are chosen
- b) probability all three colors are present
- c) probability there are exactly the same number of red as green
- d) probability there are exactly the same number of red as black
- e) expected number of red
- f) variance of the number of red
- g) expected (number of red) times (number of green)

II. Let $\sigma \in S_{20}$ is a random permutation. Compute:

- a) probability that $\sigma(1) < \sigma(2) < \sigma(3)$
- b) probability that $\sigma(1) < \sigma(2) > \sigma(3)$
- c) probability that $\sigma(1) + \sigma(2) < \sigma(3)$
- d) probability that the cycle containing 1 also contains 2
- e) probability that the cycle containing 1 also contains 2 and 3

This Homework is due Wednesday February 8, at 2:59:59 pm. (right before class). Please read the collaboration policy on the course web page. Make sure you write your name in the beginning and your collaborators' names at the end.

P.S. Each item above has the same weight.