N.I. Lobachevsky State University
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Probability theory and mathematical statistics:

Miscellania — Practice

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1. 30 books are randomly placed on a bookshelf. Among them there are 3 volumes of 'The Complete Shakespeare'. Compute the probability that the volumes numbers are in the increasing order (the volumes are not necessarily adjacent).

2. There are 10 two-rubles coins and 10 five-rubles coins in a packet. A handful of 10 coins is taken out. What is the probability that the remaining sum in the pocket is not fewer than that taken out? Find the expected value and the variance of the sum of money out of the pocket.

3. In a sequence of *n* repeated trials with the probability of a success *p* only one success occurred. What is the probability that the second trial was successful?

4. Each of k urns contains n identical balls numbered from 1 to n. One ball is drawn from every urn. Find the distribution of the greatest number drawn. Compute the expected value of the greatest number drawn when $n = 3$.

5. Two dice are rolled. Find the distribution, the mathematical expectation and the variance for the difference of numbers of points shown.

6. Only 0,5% of refrigerators come out of order during warranty period. Find the probability distribution, the mathematical expectation and the variance for the number of broken refrigerators out of 500 at the end of the warranty period.