

Title:

Selected problems of random walks

Author:

Eva Pavčová

Department:

Department of Probability and Mathematical Statistics

Supervisor:

doc. RNDr. Daniel Hlubinka, Ph.D., Department of Probability and Mathematical Statistics

Abstract:

This thesis deals with simple random walks and solutions of theoretical selected problems. We define the path which can be interpreted as the realization of a random walk. We bring forward examples of paths with illustrations and basic properties such as ballot theorem and reflection principle. Random walk is defined and also the probability of its is brought forward. Our attention is concentrated on the main lemma. We derive from it other interesting assertions such as arcsin law. The aim of this thesis is to solve the selected problems using theoretical knowledge. The problems are concerned with probabilities and numbers of paths with certain restrictions. The specific problem of positive paths proves geometrically the equality of numbers of two types of paths. Specially, we are interested in the proof of reformulation of main lemma.

Keywords: path, reflection principle, main lemma, arcsin law