

TABLE OF CONTENTS

CHAPTER I. THE CLASSIFICATION OF RANDOM WALK	PAGE
1. Introduction	1
2. Periodicity and recurrence behavior	14
3. Some measure theory	24
4. The range of a random walk	35
5. The strong ratio theorem	40
Problems	51
CHAPTER II. HARMONIC ANALYSIS	
6. Characteristic functions and moments	54
7. Periodicity	64
8. Recurrence criteria and examples	82
9. The renewal theorem	95
Problems	101
CHAPTER III. TWO-DIMENSIONAL RECURRENT RANDOM WALK	
10. Generalities	105
11. The hitting probabilities of a finite set	113
12. The potential kernel $A(x,y)$	121
13. Some potential theory	128
14. The Green function of a finite set	140
15. Simple random walk in the plane	148
16. The time dependent behavior	157
Problems	171
CHAPTER IV. RANDOM WALK ON A HALF-LINE	
17. The hitting probability of the right half-line	174
18. Random walk with finite mean	190
19. The Green function and the gambler's ruin problem	205
20. Fluctuations and the arc-sine law	218
Problems	231

CHAPTER V. RANDOM WALK ON A INTERVAL	PAGE
21. Simple random walk	237
22. The absorption problem with mean zero, finite variance	244
23. The Green function for the absorption problem	258
Problems	270
CHAPTER VI. TRANSIENT RANDOM WALK	
24. The Green function $G(x,y)$	274
25. Hitting probabilities	290
26. Random walk in three-space with mean zero and finite second moments	307
27. Applications to analysis	322
Problems	339
CHAPTER VII. RECURRENT RANDOM WALK	
28. The existence of the one-dimensional potential kernel	343
29. The asymptotic behavior of the potential kernel	352
30. Hitting probabilities and the Green function	359
31. The uniqueness of the recurrent potential kernel	368
32. The hitting time of a single point	377
Problems	392
BIBLIOGRAPHY	395
SUPPLEMENTARY BIBLIOGRAPHY	401
INDEX	403