

CONTENTS

PART I. SINGULAR INTEGRALS: AN INTRODUCTION

INTRODUCTION	1
PRELIMINARIES	2
<u>CHAPTER I: CONVOLUTIONS</u>	6
Exercises	18
<u>CHAPTER II: FOURIER TRANSFORMS</u>	19
§ 1. L^1 Theory	19
§ 2. The Inversion Formula	28
§ 3. L^2 Theory	39
Exercises	53
<u>CHAPTER III: THE HILBERT TRANSFORM</u>	55
Exercises	80
<u>CHAPTER IV: SINGULAR INTEGRALS IN E^n</u>	82
§ 1. Existence. Odd Kernels	82
§ 2. L^2 Theory. The Riesz Transforms	93
§ 3. Even Kernels. Conclusions	104
Exercises	116
BIBLIOGRAPHY	117

PART II. SINGULAR INTEGRAL OPERATORS AND DISTRIBUTIONS

PREFACE	121
NOTATION	122
<u>CHAPTER I: DISTRIBUTIONS AND FOURIER TRANSFORMS</u>	124
§ 1. Distributions	124
§ 2. Temperate Distributions and Fourier Transforms	138
<u>CHAPTER II: SINGULAR INTEGRALS AND SOBOLEV SPACES</u>	151
§ 1. Singular Kernels and their Fourier Transforms	151
§ 2. The Sobolev Spaces L_k^p and Generalizations	174
<u>CHAPTER III: SPHERICAL HARMONICS</u>	212
<u>CHAPTER IV: SINGULAR INTEGRAL OPERATORS</u>	238
BIBLIOGRAPHY	272