CHAPTER I

INTRODUCTION

The purpose of this study is to determine all functions f on a group (G, o) into a group $(G', +)$ such that

$$(*) \qquad f(x o y) + f(x o y^{-1}) = 2f(x) + 2f(y)$$

for all x, y in G. We are able to obtain only a partial solution to this problem.

In Chapter III, we characterize all f satisfying $(*)$ on abelian group (G, o) into abelian group $(G', +)$ which does not contain any element of order 2. In Chapter IV we illustrate how our result can be applied to the cases where (G, o) is a vector space over $Q, (\mathbb{R}^n, +), (\mathbb{R}^+, .)$ and $(\mathbb{R}^*, .)$. Chapter V deals with the determination of continuous functions satisfying $(*)$ on a vector group, $(\mathbb{R}^n, +), (\mathbb{R}^+, .), (\mathbb{R}^*, .)$ and $(\mathbb{C}^*, .)$.