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**Autor:** Rivano, Neantro Saavedra  
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# FINITE GEOMETRIES IN THE THEORY OF THETA CHARACTERISTICS

by Neantro SAAVEDRA RIVANO

## INTRODUCTION

The aim of this paper is to call attention upon the existence of a very simple “finite geometry” on the set of either odd or even theta characteristics (on an algebraic curve), and to develop on some of its properties and related concepts. In particular, this finite geometry allows one to place in a general context the classical theory of the 28 bitangents to a plane quartic (cf. Weber [6]).

Part I of the paper recalls the several interpretations and definitions of theta characteristics, and contains some examples to motivate the abstract developments in Part II. In this later part, the finite geometry is defined and its properties discussed. The main result is theorem II 2.6. Proposition II 4.4 is also of important practical value.

It is my feeling that the finite geometries will be of help in studying such problems as: relations between theta functions, filtrations in the space of moduli of level two structures over curves of a given genus, degeneration of algebraic curves. A sequel to this paper should contain applications to these subjects.

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## I. THETA CHARACTERISTICS ON AN ALGEBRAIC CURVE

### § 0 REVIEW: QUADRATIC FORMS IN CHARACTERISTIC 2

In this section, a number of well-known results on quadratic forms in characteristic two are recalled.