**Abstract**

An elliptic curve over a field is a set of points with an addition operation defined, making it a group. The points are determined by a so called "Weierstrass equation". In this paper we will consider these elliptic curves over finite fields, this will make the sets of points finite, and study ways of counting the number of points on a given elliptic curve. The main algorithm for counting points on elliptic curve that we will study is Shoof's algorithm, but we will also consider some other less efficient algorithms and methods of counting points on elliptic curves over finite fields.