

Abstract

The Artin Braid groups B_n are important in many mathematical fields such as topology, combinatorial group theory, geometry, singularity theory, analysis and cryptography. The notion of braids was introduced by Emil Artin in 1920s. He formalized braids as topological objects, that model the intertwining of several strings in Euclidean 3-space. He proved that braids with fixed number of n -strings form a group, which is called n^{th} braid group and is denoted by B_n . Since then, topologists and algebraists have been extensively studied braids and braid groups.

In first chapter we define relation between braids and Artin braid groups. In second section of this chapter we define Artin braid group B_n . Braid isotopy problem is a preliminary step before attempting to use braids in an effective way. In the third section of this chapter we develop the criteria for isotopic braids. Finally in this chapter we prove that Artin braid group B_n and braid group \mathbb{B}_n are isomorphic.

In the study of braid groups a primary requirement is to find a method so that we are able to decide whether two words in B_n are equal or not. The second major problem is the conjugacy problem. In this problem we have to decide whether two elements of the braid group are conjugate to each other or not. The word problem was first solved by Artin [EA] in 1925. In 1965 Garside [G] gave a new solution of word problem and the conjugacy problem. In the second chapter we reviewed the paper of the Garside [G].