

## Abstract

Knot theory is a branch of algebraic topology that is concerned with studying the interesting geometrical structures known as knots. The idea of a knot in the theory of knots is entirely different from everyday's idea of knots, that is, a knot has free ends. In knot theory a knot is defined as a knotted loop of string which does not have free ends unless we cut it using a pair of scissors.

The interesting aspect of knot theory is that it enables us to transfer techniques from graph theory, algebra, topology, group theory and combinatorics to study different classes of knots. In this dissertation we are only concerned with the relationship between knot theory and graph theory.

It is widely known in knot theory literature that a knot has a corresponding signed planar graph and that a signed planar graph also has a corresponding knot which depends on the signs of the edges of its signed planar graph. This provides a foundation of a solid relationship between knot theory and graph theory, and it allows for some of the notions in graph theory to be transferred to knot theory. In this dissertation we study the pathwidth and component number of links through their corresponding graphs.