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The Topological and Algebraic Picard Groups

UNIVERSITY OF NEW BRUNSWICK

THESIS DEFENCE AND EXAMINATION

in Partial Fulfillment

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Master of Science

by

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in the Department of Mathematics & Statistics

U.N.B., Fredericton, N.B.

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Abstract

The Picard Group of a topological space is the group of line bundles over that space. The Picard Group of an algebra is the group of line modules over that algebra. In this thesis we show that in the case of $C(X)$ the continuous function algebra over a topological space X , the balanced line modules over $C(X)$ correspond exactly to sets of sections on line bundles over X , showing the relationship between the two types of Picard Groups. In the second part of the thesis we prove that, in general, the Picard Group of a finite dimensional semisimple complex algebra is isomorphic to the symmetric group on the number of components of the algebra's Wedderburn Decomposition.