Summary

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Intersection numbers of plane curves

The first part of this paper provides the reader with a thorough overview of all of the algebraic prerequsities and, later on, the two definitions of the intersection number of two affine plane curves, algebraic and geometric, are studied into a great detail. The key result about the algebraic definition brings us to the algorithm which is one of the central parts of the paper. The algorithm consists of elementary arithmetic operations on defining polynomials of the given two curves, and it uniquely determines the intersection number in any of the points of intersection of these curves. The implementation of the algorithm in C programming language is also given so that the computing can be easily done by the computer. Another central and original result of the paper, is the proof that the two definitions of the intersection number are in fact equal. A number of examples are made which show the functionality of the algorithm and the benefits of the theorem.

In addition we start off with basic theory of projective varieties and finish the paper with Bézout theorem.

Keywords: *affine plane, projective plane, plane curve, intersection number*