

Abstract

Behavior of the intersection multiplicity of two plane algebraic curves over an algebraically closed field is simple in transversal regular cases, but it gets complicated at the curves' singularities or when special positions of the given curves happen. We focus on the internal structure of the intersection multiplicity of such cases. By existing results [Byd48], we know that the intersection multiplicity of two curves at a point P is equal to $mn + t + l$, where m and n are the multiplicities of the intersection point on the given curves, t is the number of their common tangents at this point and l is the appropriate correction term. We present necessary and sufficient conditions under which the correction term l is equal to 0 in terms of the properties of the common tangents of the curves. We propose a new decomposition of the correction term l into a finite sum of natural numbers $a_1 + \dots + a_p$ with some useful algebraic and geometric properties.

Keywords: intersection theory, algebraic varieties, geometric interpretation