

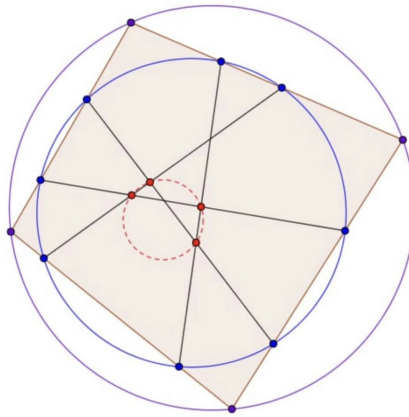
GENERALIZED CAYLEY–BACHARACH

ALEX VILLARO KRÜGER

Theorem

Let $X_1, X_2 \subset \mathbb{P}^2$ be plane curves of degrees d and e respectively, intersecting in $d \cdot e$ points $\Gamma = X_1 \cap X_2 = \{p_1, \dots, p_{de}\}$, and suppose that Γ is the disjoint union of subsets Γ' and Γ'' . Set $s = d + e - 3$. If $k \leq s$ is a nonnegative integer, then the dimension of the vector space of curves of degree k vanishing on Γ' (modulo those containing all of Γ) is equal to the failure of Γ'' to impose independent conditions on curves of degree $s - k$.

Problem



Prerequisites: Cayley–Bacharach for cubics