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Tropical approach to Nagata's conjecture

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Tropical geometry gives a geometric interpretation of a singular point influence on the coefficients of a planar algebraic curve. Suppose we consider a polynomial $F \in k[x, y]$ where k is the field of Puiseux series. The valuations of the coefficients of F define a subdivision of its Newton polygon. If the point (1,1) is of multiplicity m for F then we can find a special collection of faces in this subdivision with sum of areas at least $3m^2/8$.

This approach permits to prove an estimate $2d^2 \ge \sum m_i^2$ for the degree d of a curve passing through generic points with multiplicities m_1, m_2, \ldots, m_n , even in the situation when the ground field is finite. We will consider the same question in higher dimensions (work in progress).