

Finiteness Properties of Functions Defined by Polynomial Differential Equations

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Hilbert 16th problem (second part) can be considered as a claim that sometimes solutions of polynomial differential equations inherit finiteness properties of the algebraic functions they are defined with. While the original formulation asks about the number of limit cycles of a planar polynomial vector field, even the proof of the individual finiteness result (the so-called Dulac's theorem) is quite complicated. I will review some recent or not so recent results in this direction.