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Algebraic values of certain transcendental functions

The Bombieri-Pila theorem predicts a bound of the form $c(f, \epsilon)H^\epsilon$ for the number of rational points of height at most H on the graph of a (real analytic) transcendental function f restricted to a compact interval. Although this bound is sharp in general, for certain special cases (such as those arising under additional hypotheses on f) it can be improved to a poly-logarithmic bound in H (that is, $C(\log H)^\eta$). After briefly pointing out the connections with logic, I shall give a survey of some of our recent results in this direction.