

Density of rational points on elliptic curves and small transcendence degree

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In this paper we pursue two goals: (I) We show how Weil restrictions to real subfields can be fruitfully applied to improve transcendence results. (II) We elaborate (I) in the context of algebraic independence related to elliptic functions; we restrict thereby to results in small transcendence degree. As an appetizer for further reading we cite the following application of our work: Let L be a lattice in \mathbb{C} with algebraic invariants and let E be the associated elliptic curve over the field of algebraic numbers \mathbb{Q}^{alg} . Then E is isogenous to an elliptic curve over \mathbb{R} if and only if $w/|w| \in \mathbb{Q}^{\text{alg}}$ for some non-zero algebraic logarithm $w \in \wp_L^{-1}(\mathbb{Q}^{\text{alg}}) \cup L$.

Comments: This is a first version. The reader is highly encouraged to suggest improvements, further applications or communicate misprints

Subjects: **Number Theory (math.NT)**; Algebraic Geometry (math.AG)

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