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Algebraic Points on the Curve $X_{a,b}: w^2 = a(v^5 - b^5)$

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Abstract

In this paper, we determine the set of affine algebraic points of degree at most 4 over \mathbb{Q} on the hyperelliptic curve $X_{a,b}: w^2 = a(v^5 - b^5)$ for $(a, b) \in \{(3,1), (1,3)\}$. This extends prior works of Mulholland and Siksek, who described the set of \mathbb{Q} -rational on these curves in [4] and [5] respectively.

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