Publ. Math. Debrecen
100/3-4 (2022), 513–531
DOI: 10.5486/PMD.2022.9433

On the number of monogenizations of a quartic order (with an appendix by Shabnam Akhtari)

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Abstract. We show that an order in a quartic field has fewer than 3000 essentially different generators as a $\mathbb{Z}$-algebra (and fewer than 200 if the discriminant of the order is sufficiently large). This significantly improves the previously best known bound of 2^{72}.

Analogously, we show that an order in a quartic field is isomorphic to the invariant order of at most 10 classes of integral binary quartic forms (and at most 7 if the discriminant is sufficiently large). This significantly improves the previously best known bound of 2^{80}.

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Mathematics Subject Classification: 11R16, 11D09.
Key words and phrases: monogenic, number field, invariant order, binary form, quartic field, quartic order, Thue equation.