

FUNDAMENTAL UNITS OF SOME ORDERS GENERATED BY AN ALGEBRAIC UNIT

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Let ϵ be an algebraic unit which is not a complex root of unity. It is natural to ask whether ϵ is a fundamental of the order $\mathbb{Z}[\epsilon]$, provided that the unit rank of this order is equal to 1. We will present recent results that show that the answer is generally positive, and which give a fundamental unit of the order $\mathbb{Z}[\epsilon]$ in all cases. Now, assume that the unit rank of this order is greater than 1. It is natural to ask whether ϵ is an element of some system of fundamental units of the order $\mathbb{Z}[\epsilon]$. We will present two recent proofs of a positive answer to this question in the case that ϵ is a totally real cubic algebraic unit. Finally, we will present an update on the ongoing research on this problem.