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Normal Integral Bases of a Cyclic Quintic Field,
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Abstract

Let K/\mathbb{Q} be a finite Galois extension. A normal integral basis for K is an integral basis for K in which all the elements of the basis are conjugate over \mathbb{Q} . Let $\theta \in \mathbb{R}$ be a root of the polynomial

$$f(X) = X^5 + X^4 - 4X^3 - 3X^2 + 3X + 1.$$

Set $K = \mathbb{Q}(\theta)$. It is known that K possesses infinitely many normal integral bases. In this paper, we explicitly determine all normal integral bases of K and parametrize them using the Fibonacci and Lucas numbers.