On the minimal index and indices of the form 2^a3^b in a parametric family of bicyclic biquadratic fields

(Talk)

Borka Jadrijević
Department of Mathematics, University of Split, Teslina 12, 21000 Split, Croatia
borka@pmfst.hr

Let $c \geq 3$ be integer such that c, $c-2$, $c+4$ are square-free integers relatively prime in pairs and let $L_c = \mathbb{Q}\left(\sqrt{(c-2)\,c}, \sqrt{(c+4)\,c}\right)$ be a family of bicyclic biquadratic fields. We find minimal index $\mu(L_c)$ and determine all elements with minimal index in L_c.

Furthermore, we give some results concerning elements α with index of the form $\mu(\alpha) = 2^a3^b$. Precisely, we show that for every integer $K \geq 12$ if $c \geq K-1$ and if α is an element with index $\mu(\alpha) = 2^a3^b \leq K$, then α is an element with minimal index $\mu(\alpha) = \mu(L_c) = 12$. We also show that for every integer $C_0 \geq 3$ we can find effectively computable integers $M(C_0)$ and $N(C_0)$ such that in case $c \leq C_0$ there are no elements α with index of the form $\mu(\alpha) = 2^a3^b$, where $a > M(C_0)$ or $b > N(C_0)$.

MSC2010: 11D57, 11A55, 11B37, 11J68, 11J86, 11Y50.

Keywords: index form equations, minimal index, bicyclic biquadratic fields, simultaneous Pellian equations.

Section: 3. Number Theory.

.