Acta Mathematica Sinica, English Series 2007 23 (5): 819-826 ISSN: 0583-1431 CN: 11-1914/R

23(5)

Some Elements of Finite Order in $K_2 Q$

程晓芸(1), Jian Guo XIA(2), 秦厚荣(1)

(1)南京大学数学系; (2)南京师范大学数学系

收稿日期 2004-11-19 修回日期 网络版发布日期 2007-3-28 接受日期 2005-3-8

摘要

关键词 $K_2\mathbb Q ,$ cyclotomic polynomial Diophantine equation

分类号

Some Elements of Finite Order in $K_2 Q$

Xiao Yun CHENG(1), Jian Guo XIA(2), Hou Rong QIN(1)

(1)Department of Mathematics, Nanjing University, Nanjing 210093, P. R. China; (2)Department of Mathematics, Nanjing Normal University, Nanjing 210097, P. R. China

Abstract Let K_2 be the Milnor functor and let $\Phi_n(x)\in{\mathbb Q}[x]$ be the n-th cyclotomic polynomial. Let $G_n(\mathbb Q)$ denote a subset consisting of elements of the form $\{a, \Phi_n(a)\},$ where $a\in \mathbb Q^*$ and $\{,\}$ denotes the Steinberg symbol in $K_2\mathbb Q$. J. Browkin proved that $G_n(\mathbb Q)$ is a subgroup of $K_2\mathbb Q$ if $n=1, 2, 3, 4$ or {\rm 6} and conjectured that $G_n(\mathbb Q)$ is not a group for any other values of n. This conjecture was confirmed for $n=2^r3^s$ or $n=p^r,$ where $p\geq 5$ is a prime number such that $h(\mathbb Q(\zeta_p))$ is not divisible by $p.$ In this paper we confirm the conjecture for some $n,$ where n is not of the above forms, more precisely, for $n=15, 21, 33, 35, 60$ or {\rm 105}.

Key words $K_2\mathbb Q $ cyclotomic polynomial Diophantine equation

DOI: 10.1007/s10114-005-0852-6

通讯作者 程晓芸 xychengnt@yahoo.com.cn