Year: 1993 **Vol.: 42** **Fasc.: 3-4**

Title: An asymptotic formula concerning Lehmer numbers

Author(s): James P. Jones and Péter Kiss

Let $L_n,\ n = 0, 1, 2, \dots$, be a Lehmer sequence defined by $L_n = (\alpha^n - \beta^n)/(\alpha - \beta)$ for n odd and $L_n = (\alpha^n - \beta^n)/(\alpha^2 - \beta^2)$ for n even, where $(\alpha + \beta)^2 = A$ and $\alpha\beta = -B$ are fixed rational integers and $|\alpha| \geq |\beta|$. Let m be an integer > 1 and define the sequence (M_n) of integers by $M_n = L_{mn}/L_n$ for $n > 0$. We prove that

$$\frac{\log|M_1 \cdot M_2 \cdots M_N|}{\log[M_1, M_2, \dots, M_N]} = \frac{m-1}{6(1-w)(m - \prod\limits_{p|m} \frac{p}{p+1})}\pi^2 + O\left(\frac{\log N}{N}\right)$$

for sufficiently large N, where $w = \log((A, B))/2 \cdot \log|\alpha|$ and $[M_1, M_2, \dots]$ denotes the least common multiple of $M_1, M_2, \dots$. This result is a generalization and an improvement of a formula given by J. P. Bézivin.

Address:
James P. Jones
Department of Mathematics and Statistics
The University of Calgary
2500 University Drive N.W.
Calgary, Alberta, T2N 1N4
Canada

Address:
Péter Kiss
Department of Mathematics
Eszterházy Károly University
Leányka u. 4
3301 Eger
Hungary