The University of Georgia

Franklin College of Arts and Sciences
Department of Mathematics

Dear Dr Sun,

I just got your letter, but I have not yet found your paper. You can reach me now at my Budapest address but you can also send a copy to c/o P Erdős (Prof RL Graham Bell Laboratories Murray Hill New Jersey 07974 USA

Denote by $f(n)$ the number of solutions of

$$1 = \frac{1}{x_1} + \frac{1}{x_2} + \dots + \frac{1}{x_n}, \quad x_1 < x_2 < \dots < x_n \text{ are integers}$$

I never ~~saw~~ saw an asymptotic formula for $f(n)$.

Is it true that $\max x_{i+1} - x_i \geq 3$? 2, 3, 6 are the only solutions with $\max x_{i+1} - x_i = 3$. $x_n/x_1 \to \infty$ as $n \to \infty$??

Find an integer n for which if you color the proper divisors of n by 2 colors then n is always the monochromatic sum of (distinct) divisors. I do not know if such a number exists. Such numbers exist probably for k colors – if n_k is the smallest such number n_k (if it exists) must be quite large.

Kind regards, au revoir

E.P.

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Dear Dr Sun

Many thanks for your letter and interesting paper.

I hope you had a pleasant and useful visit to Italy.

Let $a_1 \pmod{n_1}$, $a_2 \pmod{n_2} \dots a_k \pmod{n_k}$, $n_1 < n_2 < \dots < n_k$ a covering system, I offered and offer 1000 dollars for a proof that n_1 can be as large as you please. I think $n_1 = 24$ is the current record. Let $f(n_1)$ be the smallest k for which such a system can exist (it is not even known that ~~n_1 is~~ $f(n_1)$ is finite. Can you find a lower bound for $f(n_1)$. Also can you find a lower bound for $\sum \frac{1}{n_i}$. Also a bound for n_k as a function of n_1. You can write me to the above adress.

Kind regards

Paul Erdős

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