
Zbl 656.10026

Erdős, Paul

On the irrationality of certain series: Problems and results. (In English)

New advances in transcendence theory, Proc. Symp., Durham/UK 1986, 102- 109 (1988).

[For the entire collection see Zbl 644.00005.]

The author presents a host of results and problems on the (ir)rationality of many interesting infinite series of rational numbers. For example: it is not known if $\sum_{n=1}^{\infty} \omega(n)2^{-n}$ or $\sum_{n=1}^{\infty} \phi(n)2^{-n}$ is irrational, where $\omega(n)$ is the number of distinct prime divisors of n and $\phi(n)$ is Euler's function.

The paper also contains the proof of the following theorem. Let $a_1 < a_2 < ...$ be an infinite sequence of positive integers. Let $c(n) = lcm(a_i | \ a_i < n)$. Then, under certain hypotheses on the growth of the a_i, the sum $\sum_{n=1}^{\infty} c(n)^{-1}$ is irrational.

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Classification:
11J81 Transcendence (general theory)
00A07 Problem books

Keywords:
irrationality; rationality; problems; infinite series of rational numbers; number of distinct prime divisors; Euler's function