Banks, William D.; **Güloğlu, Ahmet M.**; **Nevans, C. Wesley**; **Saidak, Filip**

Descartes numbers. (English) Zbl 1186.11004

De Koninck, Jean-Marie (ed.) et al., Anatomy of integers. Based on the CRM workshop, Montreal, Canada, March 13–17, 2006. Providence, RI: American Mathematical Society (AMS) (ISBN 978-0-8218-4406-9/pbk). CRM Proceedings and Lecture Notes 46, 167-173 (2008).

Let σ denote the sum of divisors function. The authors call an integer n a Descartes number if n is odd and if $n = km$ for two integers $k, m > 1$ such that

$$\sigma(k)(m+1) = 2n.$$

They prove:

Theorem 1. If n is a cube-free Descartes number which is not divisible by 3, then $n = k\sigma(k)$ for some odd almost perfect number k, and n has more than one million distinct prime divisors.

Theorem 2. The number $3^2 7^2 11^2 13^2 22021$ is the only cube-free Descartes number with fewer than seven distinct prime divisors.

For the entire collection see [Zbl 1142.11002].

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MSC:

11A25 Arithmetic functions; related numbers; inversion formulas
11N25 Distribution of integers with specified multiplicative constraints

Keywords:

sum of divisors; (almost) perfect numbers