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Perfect Numbers – an Echo from Antiquity and a Challenge to the Future

This paper is devoted to the perfect numbers and their historical development. A perfect number is a number, the sum of whose divisors which are smaller than this number, is equal to the number itself.

The paper examines the birth of the theory of perfect numbers in Ancient Greece and presents the proof for the Euclid's Theorem. It considers the development of the theory for the even perfect numbers and focuses on Euler's Theorem. It then discusses the question of the existence of odd perfect numbers.

The author analyses some of the attributes of even perfect numbers and their link to Pascal's triangle. Then the paper presents the peculiarities of Mersenne numbers and their relation to the even perfect numbers. On this basis some new attributes of the perfect numbers are revealed. Explored are some multitudes of numbers, which include the multitude of perfect numbers and 'friendly' numbers. The paper presents the enunciation and solutions of some interesting problems with perfect numbers. The Appendix contains references to literature where the relevant proofs can be found for the theorems given without proofs in the main text.

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