

ABSTRACT

CHARACTERISTIC OF TAU NUMBER

By

Marie Juzmiyanti

Kennedy and Cooper defined a positive integer to be a tau number if $\tau(n)|n$, where $\tau(n)$ is the number of divisors function. The first few Tau numbers are :

1, 2, 8, 9, 12, 18, 24, 36, 40, 56, 60, 72, 80, . . . ;

it is Sloane's sequence. Among other things, Kennedy and Cooper showed the Tau numbers have density zero.

The concept of Tau number was rediscovered by Colton, who called these numbers refactorable. This paper is primarily concerned with two conjectures made by Colton. Colton conjectured that the number of Tau numbers less than or equal to a given n was at least half the number of primes less than or equal to n . In this paper I show that Colton's conjecture is true for all sufficiently large n by proving a generalized version of the conjecture. I calculate an upper bound for counter examples of $7.42 \cdot 10^{13}$.

Colton also conjectured that there are no three consecutive Tau numbers. Other results are also given, including the properties of the Tau numbers as compared to the primes. Various generalizations of the Tau numbers are also discussed.

Keywords : Tau Number, Prime Number, Positive Integer