Equation for Distribution of Prime Numbers

Abstract: An equation for distribution of prime numbers is found that agree well with actual values of prime numbers in the range x. We find that Riemann's formula is approximate one. We need to study the variation of prime numbers with given number x and new variable r.

It is found that the equation for distribution of prime numbers in the range from 2 to x is given by

n=(e^(nr/x)) x/logx

This is an implicit equation.

Where x is a number and it is a prime number.

n is the number of prime numbers in the range 2 to x.

r is a new variable, but it is nearly a constant that varies from r=0.92 for x=691 to r=1.032 for x=2.99*10^13 The value of r is negative from x=2 to x=5, then the value of r gradually increases.

The value of r fluctuates like a sine wave. There are infinite prime numbers. Therefore the value of r increases very slowly. We find that Riemann's formula is approximate one. We need to study the variation of r with x and n.

If we are able to get exact equation for the distribution of prime numbers then we can easily check whether the given number is prime or not. Or conversely we can easily create prime numbers of any digit, even million digits. But to find the factors of the product of two prime numbers is not easy, that depends on the digits of the two prime numbers. We have to make continuous division of prime numbers that range from 2 to square root of the given number. This will be useful in cryptography.

References:

Wikipedia.