

## DISTRIBUTION THEOREM OF PRIME NUMBERS

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### ABSTRACT

*It is the method of finding equation of a prime numbers on the basis of mathematical equations. Through this equation we can predict their distribution and relation to prime numbers.*

$$\Pi_n = 2 \Pi_{n-1} - \Pi_{n-2} \pm 2$$

Where  $\Pi_n$ ,  $\Pi_{n-1}$  and  $\Pi_{n-2}$  are prime numbers.

### INTRODUCTION

We know prime numbers are the distribution of one degree polynomials. Distribution of one degree polynomials derived as [1]

$$Y_3 = 2Y_2 - Y_1 \quad (1)$$

Where  $Y_3$ ,  $Y_2$  and  $Y_1$  are real numbers (R). Through this equation we can predict next prime number and their distribution greater than 7.

### DISTRIBUTION THEOREM OF PRIME NUMBERS USING NUMERICAL METHODS

Let

X:  $x_1, x_2, x_3, x_4, x_5, \dots$

Y:  $y_1, y_2, y_3, y_4, y_5, \dots$

$y_1, y_2, y_3, \dots, y_n$  be the corresponding  $x_i$  values of n degree polynomial. So we can find  $Y_n$  value by without finding the polynomial. In this case  $x_i$  should be equally spaced [1].

General equation for n degree polynomial

$$Y_{q+2} = \frac{(n+1)}{1!} y_{q+1} - \frac{n(n+1)}{2!} y_q + \frac{n(n+1)(n-1)}{3!} y_{q-1} - \frac{n(n+1)(n-1)(n-2)}{3!} y_{q-2} + \dots \quad (2)$$

Where n = degree of the polynomial

we know 1,2,3,5,7,11,13,17,19,23,29,31,37,... are prime numbers. We can simply say distribution of prime number is  $\Pi_n = 2n - 1$

Where n = natural numbers. We can predict the prime numbers

i.e.

$$2 = 2 \times 1 - 0$$

$$3 = 2 \times 2 - 1$$

$$5 = 2 \times 3 - 1 \text{ etc.}$$

But in the case of

$$2 \times 5 - 1 = 9$$

$2 \times 11 - 1 = 21$  etc are not a prime number. So we need to find the exact distribution of prime numbers. From equation (2)

$$\Pi_n = 2 \Pi_{n-1} - \Pi_{n-2} \pm 2$$

Where  $\Pi_n$ ,  $\Pi_{n-1}$  and  $\Pi_{n-2}$  are prime numbers. it's valid only they are greater than 7.

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i.e;  $11 = 2 \times 7 - 5 + 2$   
 $13 = 2 \times 11 - 7 - 2$   
 $17 = 2 \times 13 - 11 + 2$   
 $53 = 2 \times 47 - 43 + 2$  etc.

## REFERENCES

1. Dileep S., 2015, [www.ijma.info](http://www.ijma.info) ISSN 2229 – 5046.

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