

## New Primality tests

Introduction :

A primality test is an algorithm for determining whether an input number is prime. Among other fields of mathematics, it is used for cryptography. Unlike integer factorization, primality tests do not generally give prime factors, only stating whether the input number is prime or not.

On the next version we will prove the primality tests formula

Test formula founction :

1/-formula one :

$$Tp(n) = n - \gcd((n-1)!, n) + 1 = n + 1 - ((n-1)! * n) / \text{lcm}((n-1)!, n)$$

2/-Formula Two:

$$T(K) = [1 - (\text{mod}(n, k) / n)] = [1 - (n - k \lfloor n/k \rfloor) / n] ; n \in \mathbb{N}$$
$$= [(n - n - k \lfloor n/k \rfloor) / n] = [k / n \lfloor n/k \rfloor]$$

3-How formula works?!

Checking if a number is prime

You may remember that a prime number is one whose only factors are itself and 1. Other numbers are called oblong numbers (they can be represented as an oblong of dots) or composite numbers.

$T_p: \mathbb{N} \rightarrow \mathbb{N}$

$$n \rightarrow T_p(n)$$

$T_p(n) = n$  if  $n$  is prime

$$T_p(n) = 1$$

$T(K) = 1$  if  $k$  is prime For  $k = n$  and  $T(k) = 0 \quad n \in \mathbb{N} - \{k\}$

Else  $T(K) = 0$  For  $n \in \mathbb{N}$