

# Primes obtained concatenating two consecutive primorial numbers then adding or subtracting 1

**Abstract.** In this paper I state the following two conjectures: (I) There exist an infinity of primes obtained concatenating two consecutive primorial numbers and adding 1 to the resulted number; example: concatenating the tenth and eleventh primorials then adding 1 is obtained the prime 6469693230200560490131; (II) There exist an infinity of primes obtained concatenating two consecutive primorial numbers and subtracting 1 from the resulted number; example: concatenating the ninth and tenth primorials then subtracting 1 is obtained the prime 2230928706469693229.

## The sequence of primorial numbers:

(A002110 in OEIS)

: 1, 2, 6, 30, 210, 2310, 30030, 510510, 9699690,  
223092870, 6469693230, 200560490130, 7420738134810,  
304250263527210, 13082761331670030, 614889782588491410,  
32589158477190044730, 1922760350154212639070 (...)

## Conjecture I:

There exist an infinity of primes  $p$  obtained concatenating two consecutive primorial numbers and adding 1 to the resulted number; example: concatenating the tenth and eleventh primorials then adding 1 is obtained the prime 6469693230200560490131.

## The sequence of primes $p$ :

: 13, 631, 30211, 2102311, 231030031,  
9699690223092871, 6469693230200560490131,  
7420738134810304250263527211 (...)

## Conjecture 2:

There exist an infinity of primes  $p$  obtained concatenating two consecutive primorial numbers and subtracting 1 from the resulted number; example: concatenating the ninth and tenth primorials then subtracting 1 is obtained the prime 2230928706469693229.

## The sequence of primes $p$ :

: 11, 5105109699689, 2230928706469693229 (...)

**Observation:**

The numbers obtained this way are products of very few prime factors; for instance, the numbers 7858321551080267055879090557940830126698960967415390  $\pm$  1 obtained concatenating the nineteenth and twentieth primorials then adding/subtracting 1 are products of two, respectively three prime factors.