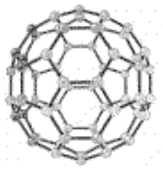

prime numbers formula

05/05/07

Home
About Me
About discovery
Photo Gallery
Contact me

NAAS (USA) Awarded A++ = Excellent Grade to article of prime numbe

Welcome to the prime numbers formula

In The Name Of God

The discovery of on-to generating function

for the prime numbers and its results

(2300-years old unsolvable problem)

$$H(m)=2\left(\frac{2m+1}{2}\right)^{\left\lfloor \frac{2m+1}{(2m)!+1}\left\lfloor \frac{(2m)!+1}{2m+1}\right\rfloor\right\rfloor}$$

Take a look at new photo gallery

Note : This formula is one of the on-to generating functions for the prime numbers that for every natural "m" it generates all the prime numbers (3,5,7,2,11,13,2,17,19, ...)

The presented "H.M" functions by Discoverer (Prof. Seyyed Mohammad Reza Hashemi Moosavi) are 6 numbers that 4 functions are by Wilson's theorem and one of them by Euler's function(φ) and one of them by Σ functions and $\lfloor\ \rfloor$ functions are discovered by discoverer (Prof.S.M.R.Hashemi Moosavi). The

software of this function is produced.

Note : **In Year of 2007 (AAAS) " National Association Of Academies Of Science " (USA) Awarded an A++ = Excellent grade to prime numbers formula and its results by prof.S.M.R.Hashemi Moosavi.**

Note : **The discovery of prime numbers formula and its results has been published under an article in journal of "Roshd of Borhan " , associated with Ministry of Education.**

★ New★

click here to see the cover and table of contents of the book" The discovery of prime numbers formula and its results"

★ **Short introduction :**

I am Dr.S.M.R.Hasheimi Moosavi.
I have discovered the formula of the prime numbers after 20 years of research. I solved the unsolvable problems related to them.

★ **Discovery results :**

1. **The distinction of the prime numbers.**
2. **The generating formula of the prime numbers.**
3. **The definition of the prime numbers set by using the generating function of prime numbers.**
4. **The generating formula of the Mersenne prime numbers.**
5. **The determining of the k-th prime number.**
6. **Solving Riemann zeta equation by using the determining of the number of the prime numbers less than or equal arbitrary number (N) exactly.**
7. **Study of the guesses of Goldbuch and Hardy.**
8. **The proof of being infinity of the prime twin couples.**

★ **Note: the results of this great discovery “the formula of generating prime numbers discovery” has been sent to most of research centers and universities of the world.**

What is a prime number?

A prime number is a positive integer that has exactly two positive integer factors, 1 and itself. For example, if we list the factors of 28, we have 1, 2, 4, 7, 14, and 28. That's six factors. If we list the factors of 29, we only have 1 and 29. That's 2. So we say that 29 is a prime number, but 28 isn't.

Another way of saying this is that a prime number is a whole number that is not the product of two smaller numbers.

Note that the definition of a prime number doesn't allow 1 to be a prime number: 1 only has one factor, namely 1. Prime numbers have *exactly* two factors, not "at most two" or anything like that. When a number has more than two factors it is called a composite number.

Here are the first few prime numbers:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97, 101, 103, 107, 109, 113, 127, 131, 137, 139, 149, 151, 157, 163, 167, 173, 179, 181, 191, 193, 197, 199, etc.

★you can read about The Largest Known Primes on the Web

What are Mersenne primes and why do we search for them?

A Mersenne prime is a prime of the form 2^P-1. The first Mersenne primes are 3, 7, 31, 127, etc. There are only 41 known Mersenne primes.

GIMPS, the Great Internet Mersenne Prime Search, was formed in January 1996 to discover new world-record-size Mersenne primes. GIMPS harnesses the power of thousands of small computers like yours to search for these "needles in a haystack".

Most GIMPS members join the search for the thrill of possibly discovering a record-setting, rare, and historic new Mersenne prime. Of course, there are many other reasons.

★for more information about Mersenne primes , History ,Theorems and lists click here .

Why do people find these primes?

"Why?" we are often asked, "why would anyone want to find a prime that big?"" I often now answer with "did you ever collect anything?"" or "did you ever try to win a competition?"" Much of the answer for why we collect large primes is the same as why we might collect other rare items. Below I will present a more complete answer divided into several parts.

1. Tradition!

2. For the by-products of the quest

3. People collect rare and beautiful items

4. For the glory!

5. To test the hardware

6. To learn more about their distribution

This does not exhaust the list of reasons, for example some might be motivated by primary research or a need for publication. Many others just hate to see a good machine wasting cycles (sitting idle or running an inane screen saver).

Perhaps these arguments will not convince you. If not, just recall that the eye may not see what the ear hears, but that does not reduce the value of sound. There are always melodies beyond our grasp.

★1. Tradition!

Euclid may have been the first to define primality in his Elements approximately 300 BC. His goal was to characterize the even perfect numbers (numbers like 6 and 28 which are equal to the sum of their aliquot divisors: 6 = 1+2+3, 28=1+2+4+7+14). He realized that the even perfect numbers (no odd perfect numbers are known) are all closely related to the primes of the form 2^p-1 for some prime p (now called Mersennes). So the quest for these jewels began near 300 BC.

Large primes (especially of this form) were then studied (in chronological order) by Cataldi, Descartes, Fermat, Mersenne, Frenicle, Leibniz, Euler, Landry, Lucas, Catalan, Sylvester, Cunningham, Pepin, Putnam and Lehmer (to name a few). How can we resist joining such an illustrious group?

Much of elementary number theory was developed while deciding how to handle large numbers, how to characterize their factors and discover those which are prime. In short, the tradition of seeking large primes (especially the Mersennes) has been long and fruitful It is a tradition well worth continuing.

★2. For the by-products of the quest

Being the first to put a man on the moon had great political value for the United States of America, but what was perhaps of the most lasting value to the society was the by-products of the race. By-products such as the new technologies and materials that were developed for the race that are now common everyday items, and the improvements to education's infrastructure that led many man and women into productive lives as scientists and engineers.

The same is true for the quest for record primes. In the tradition section above I listed some of the giants who were in the search (such as Euclid, Euler and Fermat). They left in their wake some of the greatest theorems of elementary number theory (such as Fermat''s little theorem and quadratic reciprocity).

More recently, the search has demanded new and faster ways of multiplying large integers. In 1968 Strassen discovered how to multiply quickly using Fast Fourier Transforms. He and Schönhage refined and published the method in 1971. GIMPS now uses an improved version of their algorithm developed by the long time Mersenne searcher Richard Crandall .

The Mersenne search is also used by school teachers to involve their students in mathematical research, and perhaps to excite them into careers in science or engineering.

And these are just a few of the by-products of the search.

3. People collect rare and beautiful items

Mersenne primes, which are usually the largest known primes, are both rare and beautiful. Since Euclid initiated the search for and study of Mersennes approximately 300 BC, very few have been found. Just 37 in all of human history--that is rare!

But they are also beautiful. Mathematics, like all fields of study, has a definite notion of beauty. What qualities are perceived as beautiful in mathematics? We look for proofs that are short, concise, clear, and if possible that combine previous disparate concepts or teach you something new. Mersennes have one of the simplest possible forms for primes, 2^n-1. The proof of their primality has an elegant simplicity. Mersennes are beautiful and have some surprising applications.

4. For the glory!

Why do athletes try to run faster than anyone else, jump higher, throw a javelin further? Is it because they use the skills of javelin throwing in their jobs? Not likely. More probably it is the desire to compete (and to win!)

This desire to compete is not always directed against other humans. Rock climbers may see a cliff as a challenge. Mountain climbers can not resist certain mountains.

Look at the incredible size of these giant primes! Those who found them are like the athletes in that they outran their competition. They are like the mountain climbers in that they have scaled to new heights. Their greatest contribution to mankind is not merely pragmatic, it is to the curiosity and spirit of man. If we lose the desire to do better, will we still be complete?

5. To test the hardware

Since the dawn of electronic computing, programs for finding primes have been used as a test of the hardware. For example, software routines from the GIMPS project were used by Intel to test Pentium II and Pentium Pro chips before they were shipped. So a great many of the readers of this page have *directly* benefited from the search for Mersennes.

Slowinski, who has help find more Mersennes than any other, works for Cray Research and they use his program as a hardware test. The infamous Pentium bug was found in a related effort as Thomas Nicely was calculating the twin prime constant.

Why are prime programs used this way? They are intensely CPU and bus bound. They are relatively short, give an easily checked answer (when run on a known prime they should output true after their billions of calculations). They can easily be run in the background while other "more important" tasks run, and they are usually easy to stop and restart.

6. To learn more about their distribution

Though mathematics is not an experimental science, we often look for examples to test conjectures (which we hope to then prove). As the number of examples increase, so does (in a sense) our understanding of the distribution.

Why do people find these primes? is adapted from

http://primepages.org/notes/faq/why.html by professor Chris K. Caldwell

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