

国家创新系统监测

——启发、实践与未来——

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起源

A prime number is a number that has exactly two divisors.

What Are Prime Numbers?

Definition

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- 3 is prime (two divisors: 1 and 3).

What Are Prime Numbers?

Definition

A **prime number** is a number that has exactly two divisors.

Example

- 2 is prime (two divisors: 1 and 2).
- 3 is prime (two divisors: 1 and 3).
- 4 is not prime (**three** divisors: 1, 2, and 4).

There Is No Largest Prime Number

The proof uses *reductio ad absurdum*.

Theorem

There is no largest prime number.

Proof.

1. Suppose p were the largest prime number.
2. Consider the number $q = p + 1$.
3. q is not prime, because it is divisible by p .
4. But $q + 1$ is greater than 1, thus divisible by some prime number not in the first p numbers. □

There Is No Largest Prime Number

The proof uses *reductio ad absurdum*.

Theorem

There is no largest prime number.

Proof.

1. Suppose p were the largest prime number.
2. Let q be the product of the first p numbers.
3. $q + 1$ is greater than 1, thus divisible by some prime number not in the first p numbers.
4. But $q + 1$ is greater than 1, thus divisible by some prime number not in the first p numbers. □

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Theorem

There is no largest prime number.

Proof.

1. Suppose p were the largest prime number.
2. Let q be the product of the first p numbers.
3. Then $q + 1$ is not divisible by any of them.
4. But $q + 1$ is greater than 1, thus divisible by some prime number not in the first p numbers. □

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What's Still To Do?

- Answered Questions
 - How many primes are there?
- Open Questions
 - Is every even number the sum of two primes?

What's Still To Do?

Answered Questions

How many primes are there?

Open Questions

Is every even number the sum of two primes?



[Goldbach, 1742] Christian Goldbach.

A problem we should try to solve before the ISPN ' 43
deadline,

Letter to Leonhard Euler, 1742.

and he can then add a citation:

Open Questions

Is every even number the sum of two primes? [1]