Re: Relative Cardinality

Source: http://sci.tech−archive.net/Archive/sci.math/2005−07/msg00778.html

- *From*: "Proginoskes" <proginoskes@xxxxxxxxxxxxx>
- *Date*: 6 Jul 2005 17:09:16 −0700

mueckenh@xxxxxxxxxxxxxxxxx wrote:
> Randy Poe wrote:
> > mueck...@xxxxxxxxxxxxxxxxx wrote:
> > > As this would lead to strange results like Card(N) =
> > > Card({Primes}),
> >
> > Of course, Card(N) does equal Card(Primes).
> >
> > Does WM think there is a natural number n such that the
> > n−th prime does not exist?
>
> Yes, it is so. I am not sure, whether sequences like 111...111 with n
> 1's or like 10^2n − 10^n + 1 do ever cease to supply primes now and
> then.

That is an irrelevant comment, because there are prime numbers which
are not of that form (like 2).

> In principle such numbers with 10^10000 digits do exist and
> perhaps could be prime. The prime number 10^100 does not exist,
> however, for the simple reason that we cannot count up to that number
> step by step.

Er ... Euclid proved that there are an _infinite_ number of primes.

If in fact there are only a finite number of primes, list them as p_1,
p_2, ..., p_k.
Let N = p_1 * p_2 * ... * p_k + 1. Then there is a prime number p that
divides evenly into N. This p cannot be p_1, since the remainder when
you divide N by p_1 is 1. Similarly, p is not p_1, ..., p_k, so it's
not on the list. But this contradicts the assumption that the list is
complete. So there cannot be an infinite number of primes.

What do you find wrong with that proof?

−−− Christopher Heckman

.

- ***Follow−Ups***:
  - ***Re: Relative Cardinality***
    - *From:* mueckenh
- ***References***:
  - ***Re: Relative Cardinality***
    - *From:* mueckenh
  - ***Re: Relative Cardinality***
    - *From:* Virgil
  - ***Re: Relative Cardinality***
    - *From:* mueckenh
  - ***Re: Relative Cardinality***
    - *From:* Dik T. Winter
  - ***Re: Relative Cardinality***
    - *From:* mueckenh
  - ***Re: Relative Cardinality***
    - *From:* Randy Poe
  - ***Re: Relative Cardinality***
    - *From:* mueckenh

- Prev by Date: ***Re: logic question***
- Next by Date: ***Re: The Math Behind IQ Tests***
- Previous by thread: ***Re: Relative Cardinality***
- Next by thread: ***Re: Relative Cardinality***
- Index(es):
  - ***Date***
  - ***Thread***