# Re: Is continuum completely filled up?

***Source:*** http://sci.tech−archive.net/Archive/sci.math/2007−02/msg03410.html

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- *Date*: Mon, 19 Feb 2007 03:23:06 +0900

"Randy Poe" <poespam−trap@xxxxxxxxx> wrote in message
news:1171305792.356636.212540@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

> We don't. We define 0.999... as the limit of the sequence
> S_n = sum(k=1,n) 9/10^k

Yes, and value of this sum = 1, at the same time.

> The LIMIT of this SEQUENCE is 1.

I agree.

> I accept this.
> This is difinition of the sum of Cauchy sequence.

> Yes. The "infinite sum" is not actually a sum. It
> is a limit of a sequence of sums.

OK.

> I accept your opinion.

> Good. But the fact that you continue means you do
> not in fact accept my opinion.

I accept your argument including above so far . I shall show the reason why

I
don't accept your conclusion below.

> You know difinition of pi, but probably you cannot compare two infinite decmals.

Yes, I can compare infinite decimals. For example,
I can ask whether 52163/16604 > pi, 52163/16604 < pi,
or 52163/16604 = pi. Both of these numbers have
infinite decimal expansions. Nevertheless, I can
compare them.

pi = 3.14159 26535 89793 238...
52163/16604 = 3.14159 238737 653...

Now in each case I have stopped at a finite number
of digits, and there are uncountably many numbers
which share those initial digits.

Nevertheless, I have enough information to determine
that 52163/16604 < pi. As I said, if any number is unequal
to pi, th