

Re: PI random? Debate running in circles (you try making math jokes)

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- *From:* huangxienchen@xxxxxxxxxx
 - *Date:* 17 Dec 2006 08:27:11 -0800
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T.H. Ray wrote:

Tim Peters wrote:

[Herman Rubin]

...

For a number to be random,
there must be no

computable

formula f such that the
 $f(k)$ -th digit to a given

base

is not uniformly distributed.

[Proginoskes]

I looks like a line got eaten by the Usenet

Gremlin here. "Uniformly

distributed" is not the same thing as
"random".

Don't overlook the "no computable formula" part:

that makes it much

stronger than "uniformly distributed" alone. For a

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hint about why, remove

"computable" from what he wrote, then prove that

/no/ random number exists

by that butchered criterion. For much more on this

approach, see Knuth,

TAoCP, Volume 2, Chapter 3, section 3.5 ("What is a random sequence?").

To paraphrase Chaitin (who is right), "There is no way to know if a given sequence of digits has been generated by a random process or not."

How many times do I have to tell you guys – pure disorder is trivial.

So, you ask, "Are the digits of Pi randomly distributed?" I'll tell you the exact answer, it is both yes and no.

Why, you ask, can the answer be both yes and no?

To which he replies, "Because the notion of randomness invokes the trivial, you have also invoked a singularity of logic".

Your question about randomness of Pi is no different than the next one

:

Given the number 0, and knowing that $0 = 0 * a$, what is a?

It is still a. Multiply a by zero and the result is still zero, because zero has no multiplicative identity. The multiplicative identity $a = 1 * a$ preserves the identity of a. $0 = 0 * a$ preserves the identity of zero.

Mathematics has logical rules and relations to deal with all your philosophical concerns about arithmetic. There is no crisis.

Tom

I dont think it's a crisis either. Frankly I think it's a thing of beauty. But most people are trained to think deterministically.

What I am saying is that based on the original question, the value of "a" is strictly indeterminate.

This does not invalidate any math – rather – I think that it adds quite a bit of beauty to the the real number zero. And hopefully might clarify some misguided ideations of randomness.

Zero is an "existentially nontrivial" number which represents a trivial quantity. An "nontrivial trivial".

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