

Re: goldbach's conjecture

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Fernando wrote:

I would forget the reference to God, although I understand that it isn't a bad literary reference.

All

what I can say if I understand something of this,

is

that natural numbers are an extreme way of freezing

time

and in that sense non- prime natural numbers are exactly those that present discontinuities on

some

structures isomorphic to \mathbb{N} and never the primes. Curiously according to this, are just the primes,

"the

atomic entities", those whose behaviour is regular,

not

backwards. Well, this is not my own opinion, I

don't

say this, Mathematics, formulas, say this. Vortex points, an "irregularity", characterize non-primes.

I

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prefer now not to talk about Goldbach's Conjecture,
formulas and not me say something more about

addition

and multiplication in that context.

Once, an excellent mathematician wrote to me

something :

Hagman replied:

Please revisit the label "excellent mathematician"
after
reading my remarks below.

"...one may write an equation --- for example, $7 + 5$

=

12 --- that satisfies all the characteristics of an
equation (equality, reflexivity, transitivity),

yet

does not satisfy a third characteristic necessary

to a

proof: that the numerical properties of the

equation

hold for all time. In other words, we cannot

capture

all of the information needed to answer the

question

("Can every even integer greater than 2 be

expressed as

the sum of two primes?") within the axioms and

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rules of

classical arithmetic. There aren't enough

dimensions."

Ehm, how can a *single* equation satisfy e.g. transitivity?

And I'd interpret the statement that "the numerical properties ...

hold for all time" more in the direction that $7+5=12$ will

still be true in 100 years.

Whether or not Goldbach's conjecture is true or not, however, has nothing to do with such a stability over time,

hence the "In other words" is quite absurd.

And how does he come to the conclusion that

Goldbach's conjecture is not provable/disprovable "within the axioms

and rules of classical arithmetic" (at least that's how I

see myself forced to interpret the last 5 lines)?

Wouldn't that handwaving "too many dimensions" argument

imply as well that the question "Can every even integer be written

as the sum of at most 6 primes?" cannot be answered either?

I claim no excellence, nor even mediocrity.

I will own up to the words Fernando quotes, however, which were written in private correspondence.

The statements are neither nonstandard nor controversial.

Transitivity is a property of the equals relation, and thus a property of every equation; it contributes the very meaning of a mathematical operation requiring "a move in time," to borrow Brouwer's words.

The "...at most six primes ..." (a result on an upper bound of the weak GC, due to Ramare using a Vinogradov result) does not apply here. A proof of the strong Goldbach Conjecture would in fact imply the weak version.

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That $7 + 5 = 12$ holds for "all time" is not at issue. The "all time" result is for arbitrarily chosen primes summing to some even integer. Simply calculating and verifying any particular result does not count as proof. Karl Popper (*Realism and the Aim of Science*, Routledge 1983) demonstrated the difference between verifiability and falsifiability:

Popper called the Goldbach Conjecture true if, G: For every natural number $x > 2$, there exists at least one natural number y such that $x+y$ and $(2+x)-y$ are both prime. Popper called the Twin Primes Conjecture true if H: For every natural number $x > 2$, there exists at least one natural number y such that $x+y$ and $(2+x)+y$ are both prime.

G is demonstrable by iterated arithmetic calculation. A program to test the conjecture potentially halts when it comes on a counterexample. H is not (in Popper's context of computational falsifiability) testable at all.

Neither conjecture is verifiable, but of these propositions—which differ only by one sign change—only GC is falsifiable. Significance?—the weak GC belongs to the same class of non-falsifiable problems (using Popper's context) as the twin primes conjecture. One would think that a natively falsifiable conjecture gives us a better chance at a computationally tractable (therefore convincing) proof. The line about dimensions refers simply to complex analysis, which is a two-dimensional tool. Vinogradov's attack on the weak GC (and therefore Ramare's result as well) removed the necessity to assume the truth of the Riemann Hypothesis (which of course lives in the complex plane) in order to attack Goldbach. I still think RH and GC are linked. I may be wrong, but I won't be alone.

Tom

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