Re: Computability

Source: http://sci.tech−archive.net/Archive/sci.math/2008−01/msg02193.html

- *From*: quasi <quasi@xxxxxxxx>
- *Date*: Mon, 14 Jan 2008 20:39:50 −0500

On Mon, 14 Jan 2008 16:42:38 −0800 (PST), The Dougster 22044
<DGoncz@xxxxxxxxxxxx> wrote:

> On Jan 14, 4:46 am, quasi <qu...@xxxxxxxx> wrote:
>
> > On Mon, 14 Jan 2008 04:14:39 −0500, quasi <qu...@xxxxxxxx> wrote:
> >
> > > On Sun, 13 Jan 2008 20:02:36 −0800 (PST), The Dougster
> > > 22044
> > > <DGo...@xxxxxxxxxxxx> wrote:
> > >
> > > > If (x/y)^p == −1 then (x/y)^2p == 1 and
> > > > o(x/y,z) = 2p But we
> > > > lose information when we write o(x/y,z) =
> > > > 2p. That doesn't
> > > > specify that (x/y)^p == −1. (x/y)^p could be
> > > > congruent to x for
> > > > all we know! It just doesn't say.
> > >
> > > Right.
> > >
> > > Let me try to restate your conjecture ...
> > >
> > > For greater simplicity, I won't bother with the order function.
> > > Instead, I'll just use the divisibility relation.
> > >
> > > Dougster's conjecture:

There do not exist positive integers x,y,z such that

(1) x < y < z < x+y

(2) x,y,z, are pairwise coprime

(3) z − y is not a multiple of x

(4) For some prime p > 2,

x | z^p − y^p
y | z^p − x^p
z | x^p + y^p

Remarks:

(1) For p = 3, your conjecture holds for z <= 1000.

(2) As you've previously noted, if a proof of your conjecture could be
had, that would yield an instant proof of FLT, however the known truth
of FLT does not appear to yield a proof of your conjecture.

(3) As far as trying to prove your conjecture, I would start with a
fixed prime, for example p = 3.

quasi

> ==========
> In the future, for new posts, please start the subject line with
> a
> prefix of "−− ". By using this convention, such posts can be
> quickly
> recognized as "non−spam". Thanks.
> ==========

> Well, it appears that your conjecture fails.
>
> Here's a counterexample:
>
> (x,y,z) = (43, 638, 659)
>
> with p = 7.

Well, I wrote a check(x,y,z) function just for this counterexample,
and no, it doesn't check out. I am flagging five conditions:

PASS: x < y < z < x+y
PASS: (x,y) = (y,z) = (z,x) = 1
PASS: (o(x/y,z), o(z/x,y), o(z/y,x)) = (2p, p, p)
PASS: (x/y)^p mod z == −1
FAIL: x + y − z = 0 (because x == y == z mod p here)

Well that's the _new_ condition.

That condition was added after I posted the counterexample.

The old conditions only specified the other tests.

> Hm. Some days when I am riding my bicycle I seem to see an answer to
> this problem, a contradiction buried here that would prove FLT. Maybe
> one day it will come to me, or to one of you.

Not likely. Firstly, it's probably not true. On the other hand, if it
is true, there's no reason to expect an elementary proof.

Bottom line −− defer this quest until you know a _lot_ more math.
Don't let it compete for time against the time needed to break through
to more advanced levels.

> Note, 43 == 638 == 659 == 1 mod 7.

Right.

So the new condition, makes your conjecture harder to defeat.

However there may still be counterexamples, simply less of them.

If you keep on adding more conditions every time you are presented with counterexample, you can keep the conjecture alive forever, but it would be artificial.

Looking at it in terms of probabilities, assuming independence of all the conditions, the probability may now be very close to zero. Thus, for example, if the probability is 1/2^100, you are unlikely to find such a counterexample, even though such an example almost surely exists.

I don't see any strong reason _why_ your conjecture should hold.

Moreover, given that each of the previous versions has fallen to counterexamples, skepticism seems called for.

quasi
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A number of sci.math participants have agreed to start all new article using a subject line with a prefix of "−− ". By using this convention, most such posts (but perhaps not all) can be quickly recognized as "non−spam". I _encourage_ others to try the idea. It's just an experiment to see if we can create an effective way to quickly recognize a message as probably non−spam.
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