Re: um.....this is...!

Source: http://sci.tech−archive.net/Archive/sci.math/2004−10/1585.html

---

From: mina_world (*mina_world_at_hanmail.net*)
Date: 10/06/04

```
Date: Wed, 6 Oct 2004 09:38:53 +0900
```

"Ignacio Larrosa Ca?stro" <ilarrosaQUITARMAYUSCULAS@mundo−r.com> wrote in message news:2sfst4F1kkvtbU1@uni−berlin.de...
> En el mensaje:cjudamqor1@news.hananet.net,
> mina_world <mina_world@hanmail.net> escribi?
> > hello.....doctor~
> >
> > a_1 = 1
> >
> > 2{a_(n+1)} = 3*a_n + sqrt{(5(a_n)^2) + 4} (n >= 1)*
> >
> > show that there does not exist n such that 1989 | a_(2n).
> > (n is positive integer)
> >
> > −−−
> >
> > um....it's so difficult to me.
> >
> > i need your advice.
> >
> > thank you very much for your advice.
>
> Hint: Prove that a(n) = Fibonacci(2n)
>
>

um.....
a_1 = 0
a_2 = 1
a_3 = 3
a_4 = 8
a_5 = 21
a_6 = 55

a_(n+1) − 3.a_n + a_(n−1) = 0 by rule.

and

a_n = (1/sqrt(5))*{((3+sqrt(5))/2)^(n−1) − ((3−sqrt(5))/2)^(n−1)}
= (1/sqrt(5))*(2/(3+sqrt(5)))*{((3+sqrt(5))/2)^n − ((3−sqrt(5))/2)^n}
by characteristic equation.

and

a_2n = (1/sqrt(5))*(2/(3+sqrt(5)))*{((3+sqrt(5))/2)^(2n) − ((3−sqrt(5))/2)^(2n)}
= (1/sqrt(5))*(2/(3+sqrt(5)))*{((14+6.sqrt(5))/4)^n − ((14−6.sqrt(5))/4)^n}

and

let a_2n = b_n
b_(n+2) = 7.b_(n+1) − b_n by reverse pursuit to characteristic equation.

and

b_1 = a_2 = 1 (mod 9)
b_2 = a_4 = 8 (mod 9)

and

suppose that
b_(2n−1) = 1 (mod 9)
b_2n = 8 (mod 9)

b_(2n+1) = 7.b_(2n) − b_(2n−1) = 7.8 − 1 = 55 = 1 (mod 9)
b_(2n+2) = 7.b_(2n+1) − b_(2n) = 7.1 − 8 = −1 = 8 (mod 9)

by mathematical induction,
b_(2n) = 8 (mod 9)
b_(2n+1) = 1 (mod 9)

but, 1989 = 0 (mod 9)

thus, 1989 | b_n = a_2n is impossible.

---

um.....is it insufficient ??

thank you very much.