

Re: 1/89 and the Fibonacci sequence-

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 - *Date:* Wed, 07 Sep 2005 21:43:00 +0100
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Not necessary to stay silent about the 1/89 mystery and related mysteries:

Try and explore power series developments like...

$1/(1 - x - x^2) = 1 + x + 2x^2 + 3x^3 + 5x^4 + \dots$,
which gives $1/0.89 = 1.1235\dots$ and $1/0.9899 = 1.0102030509\dots$

You will see the Fibonacci numbers being generated when you develop the power series, and you will see them to fall into place when you multiply out the identity
 $1 = (1 - x - x^2)(1 + x + 2x^2 + 3x^3 + 5x^4 + \dots)$

$1/(1 - x) = 1 + x + x^2 + x^3 + \dots$,
which gives $1/0.98 = 1.020408163265\dots$ and $14/0.98 = 100/7 = 14.285714\dots$;
 $1/0.998 = 1.002004008016032064128256513\dots$; $1/0.997 = 1.003009027083\dots$

All power series developments of reciprocals of polynomials yield recurrent relations for the coefficients.

Cheers - Johan E. Mebius

Dan wrote:

>Sorry about the multiple posts but this was
>a bitch to edit!
>
>The mystery of 1/89 and the Fibonacci sequence
>
>
>1/89 =
>01123595505617977528089887640449438202247191/

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>..
>With a continuing decimal expansion that has
>a period of 44.
>
>Then adding the Fibonacci sequence in this manner --
>***OOPs- fixed below***
>0112358
>
>>>>>+13
>>>>>+>21
>>>>>+>>34
>>>>>+>>>55
>>>>>+>>>>89
>>>>>+>>>>>144
>>>>>+>>>>>>233 Which creates a right
>>>>>+>>>>>>>377 one step offset.
>>>>>+>>>>>>>>610
>>>>>+>>>>>>>>>987
>>>>>+>>>>>>>>>>1597
>>>>>+>>>>>>>>>>>2584
>>>>>+>>>>>>>>>>>>4181
>>>>>+>>>>>>>>>>>>>6765
>>>>>+>>>>>>>>>>>>>>10946
>>>>>+>>>>>>>>>>>>>>>..... etc.
>
>-----
>01123595505617977528089887640449438202247191...
>= 1/89?
>
>Will this continue repeating the period of 1/89
>no matter how many fibonacci numbers are added
>in this manner?
>
>If it does, can it be proved?
>
>Others like 1/80 can be represented as --
>The sequence of -- 0,1,2,4,8,16,32,64,128...
>
>>.01248
>>+>>16
>>+>>>32
>>+>>>>64
>>+>>>>>128
>>+>>>>>>256
>>+>>>>>>>512
>>+>>>>>>>>1024
>>+>>>>>>>>>2048
>>+>>>>>>>>>>4096
>>+>>>>>>>>>>>8192
>>+>>>>>>>>>>>>16384
>>+>>>>>>>>>>>>>32768
>>+>>>>>>>>>>>>>>65536
>>+>>>>>>>>>>>>>>>..... etc.
```

