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12c Platinum Perpetuity challenge

*Message #1 Posted by **tony** on 18 July 2003, 4:17 a.m.*

If you have an unemployed 12cP, see if it will solve for i for this transaction:

f CLEAR FIN

360 n

100 PV

10 CHS PMT

i

My 12cP has taken 3.25 hours on this so far. I was wondering if all 12CP behave the same way. The answer is 10. This is a really elementary transaction, but even the gold 12C makes rather a meal of it, taking 25 seconds (normally it finishes within 12 or so seconds). I have heard that the 12CP is "sold out" in Hong Kong, and wonder if this is happening elsewhere. maybe a new ROM is in the works? If so, then this n=360 example will be a good test of it.

Re: 12c Platinum Perpetuity challenge

*Message #2 Posted by **Pierre Brial** on 18 July 2003, 7:47 a.m.,*
in response to message #1 by tony

My 12C made in Malaysia in 1999 take 24.28" to perform the test. I'm surprised of the bad result of the 12cp. May be it isn't as smart as the nice pictures of it on hp website let believe ? Or may be the 1970-80 calculator advanced technology is definitely lost now ?

All the Best

Pierre

Re: 12c Platinum Perpetuity challenge

*Message #3 Posted by **tony** on 18 July 2003, 1:06 p.m.,*
in response to message #2 by Pierre Brial

Yes, the gold 12C is rock-solid. My 12CP is still "running" after 12 hours now. Very good battery life!<G>

The funny thing is I am sure this test did work before, but maybe I just finished it with ON ON <G>

I don't think I've seen any TVM implementation by HP or otherwise (Sharp, TI) where an elementary case like this never converges.

Yes, apparently the 12C source code was "lost" by HP, which is quite bizarre in itself! The old knowledge is not lost, it is just a little more tricky to implement than at first glance. Compound interest has an almost trivial appearance, as (1+x)^n, where x is typically a "small" number, *seems* so simple. I guess the 12CP i-solving is just an example of what can happen if a company simply "outsources" software development to the cheapest provider, assuming that "anybody can do this trivial stuff"? All we need is another development cycle, probably.

The 12CP just needs a new ROM.

n=360,PV=10,PMT=-1 will be a good check of it :)

Re: 12c Platinum Perpetuity challenge

*Message #4 Posted by **Pierre Brial** on 18 July 2003, 3:59 p.m.,*
in response to message #1 by tony

I just try the test with another old "grognard", a TI-59 bought in 1979. There is a TVM program in the standard module. It takes 1' 42" to solve the problem. Less good than the 12C, but far best than the 12cp ! Someone have an hp-80 (the first financial calc !) to try Tony's test ?

All the best

Pierre

Re: 12c Platinum Perpetuity challenge

*Message #5 Posted by **Doug Burkett** on 18 July 2003, 10:44 p.m.,*
in response to message #4 by Pierre Brial

<<I just try the test with another old "grognard", a TI-59 bought in 1979.>>

The TI Voyage 200 Finance flash app finds the result in less than one second.

I had planned to get a 12cp for my wife so I could permanently add her 28C to my collection. Guess I'll wait.

P.S. 'gorgnard' - I love that word ...

Re: 12c Platinum Perpetuity challenge

*Message #6 Posted by **bill platt** on 18 July 2003, 4:35 p.m.,*
in response to message #1 by tony

Hi Tony,

Where is Norm when we need him? OK, I'll fill in for him....."there is only one way to improve the platinum--put it on the railroad tracks and come back after the midnight freight train has rolled through."

Judging from the number of bugs I have heard about here and at comp.sys.hp48, it seems that this product should be cancelled--or re-designed.

Did you here about the programming bug? Apparently it cannot handle a GTO if it is placed past line 252 (or is it 253)?

And there are others.....

Regards,

Bill

Re: 12c Platinum Perpetuity challenge

*Message #7 Posted by **Ernie Malaga** on 18 July 2003, 8:23 p.m.,*
in response to message #1 by tony

Tony:

Your post reminded me of a similar case with IBM System/36. In this minicomputer, you could perform calculations in its Operation Control Language (OCL) like this:

// EVALUATE P1=1000000000/1

...which would divide 1E9 by 1. Simple? You bet. The problem was in IBM's implementation -- repeated subtraction. So the poor machine had to repeat 1E9 subtractions. That IBM could implement such brain-dead algorithm I still find unbelievable.

I never ran this test, but similar ones (with less zeroes).

-Ernie

Re: 12c Platinum Perpetuity challenge

*Message #8 Posted by **tony** on 18 July 2003, 9:15 p.m.,*
in response to message #7 by Ernie Malaga

Interesting! Yes, would be slow<G>. But would at least finish - I stopped by 12CP after about 13 hours. I assume it would simply run the batteries flat, and probably wipe my program memory as well.

Re: 12c Platinum Perpetuity challenge

*Message #9 Posted by **Les Bell [Sydney]** on 18 July 2003, 8:42 p.m.,*
in response to message #1 by tony

My 41CX with Financial Pac took 28 seconds.

Seems to me that the 12CP is a fitting symbol for the New HP.

Best,

--- Les [http://www.lesbell.com.au]

Re: 12c Platinum Perpetuity challenge

*Message #10 Posted by **tony** on 18 July 2003, 9:10 p.m.,*
in response to message #9 by Les Bell [Sydney]

yep, the financial pac is pretty stable. I just tried my 41cx with the PPC ROM "FI" and it gives the 10 almost instantly (~1 second I guess) The "FI" article in PPC ROM User's manual pp148-164 is an absolute classic. Got me interested in TVM when i saw it back in 1982. Graeme Dennes and Don Dewey did a great job.

To be fair on the new HP I'm sure quite a lot of effort went into the 12CP. Maybe just one final iteration of the ROM is required. Maybe two :-)

Re: 12c Platinum Perpetuity challenge

*Message #11 Posted by **Thomas Cox** on 18 July 2003, 9:04 p.m.,*
in response to message #1 by tony

Try the same problem on HP 48GX with built-in TVM solver, get correct answer in about 2 seconds. Same approximate time on TI Advanced Business Analyst.

How can one rate a calculator as satisfactory unless it can correctly solve routine problems in a reasonable amount of time?

Re: 12c Platinum Perpetuity challenge

*Message #12 Posted by **tony** on 18 July 2003, 9:29 p.m.,*
in response to message #11 by Thomas Cox

yep, after the 12C all HP TVM run on the faster Saturn chip, which probably disguises algorithmic deficiencies. Seems like the 12CP managed to escape from beta-testing too soon!

Maybe it should be code-named "Houdini" :)

Or maybe HP have a cunning plan to issue another ROM anyway, after a public beta-testing phase.

In a way it lives up to it's name, "Platinum" if one remembers the broad nosed "platypus", or the "platykurtic" distribution, and interprets "broad" as meaning "long time". Yes, indeed, maybe it will produce an answer to this perpetuity, a new category of "answer" ... not a real number or an imaginary number but .. a platy-number<G>

Accuracy × Internal # of digits

*Message #13 Posted by **Vieira, Luiz C. (Brazil)** on 18 July 2003, 11:44 p.m.,*
in response to message #1 by tony

Hi, folks;

I could not help myself not adding an spiced comment: could we consider the following situation as feasible?

If, only if, original HP12C code was kept and a virtual HP12C runs to emulate it (most likely it's not what happens here), what's the chance that the interactive [i] computing that used to deal with 12-digit mantissa numbers now runs with a 16-digit base? What sort of approach we would find as for "A=B?" when iteractive calculus goes from (+) to (-) around the "zero" a lot of times more frequently? If the iteractive procedure converges with 12-digit mantissa numbers in a couple of seconds, what would it happen if the same process now handles a 16-digit mantissa base number? I'm not sure if I read this informatin here, but the HP12cP

processor handles 16-bit mantissa numbers. If original HP12C code runs in an emulator that handles 16-bit mantissa numbers, I understand that at least relational operators will be simulated in the 16-digit "machine", and they will return "true" or "false" based on that. I wonder about what sort of beast we are dealing with...

Well, this is just a guess.

Luiz (Brazil)

Re: Accuracy × Internal # of digits

*Message #14 Posted by **tony** on 19 July 2003, 12:44 a.m.,*
in response to message #13 by Vieira, Luiz C. (Brazil)

I don't know the answer. Visually the 12cp has a 10 digit mantissa. Arithmetically the 12cp processor seems to be fine. My impression is that the i-solving exit criterion is somehow "too tight". Only slightly so - it is hard to find cases that seemingly never converge. Also the i-solving algorithm itself is apparently inefficient - my guess is there is a simple coding mistake as it is quite easy to slow it down this way. In a way it is a remarkable under-achievement - who would have thought HP could have invented the worst i-solver ever seen in any financial calculator ever manufactured? That is what seems to have happened. I have never seen anything like it, made by HP, Sharp or TI. Makes it VERY collectable! I am sure the traditional HP quality will show in the next version :)

Worst case of wishful thinking

*Message #15 Posted by **Valentin Albillo** on 19 July 2003, 1:12 a.m.,*
in response to message #14 by tony

Tony posted:

"In a way it is a remarkable under-achievement - who would have thought HP could have invented the worst i-solver ever seen in any financial calculator ever manufactured?"

Noone, because as you fully well know, though you pretend not to, HP "invented" nothing. This "worst i-solver" was "invented" by Kinpo, which is the real manufacturer of the piece of crap called HP-12C Platinum. HP had nothing to do with this, except commission Kinpo to manufacture said crap and pay the bill.

"Makes it VERY collectable!"

Only if you happen to collect crap and garbage. Would you also call the HP6S, etc, "very collectable" ? I'm glad I'm no such kind of collector.

"I am sure the traditional HP quality will show in the next version :)"

Worst case of wishful thinking I've ever seen, unless you're saying it tongue-in-cheek. How on Earth can "traditional HP quality" show on any calculator NOT manufactured by HP ? If your, say, excellent cook aunt Gussie were to commission her excellent cookies to some cheap-as-hell Taiwanese cook, would they still be aunt Gussie's "traditional quality cookies" ? Come on !

HP will *never* again put on the market anything but Kinpo crap, real garbage if I ever saw one, at luxury prices. I know of several business people very fond of the original HP-12C that wouldn't touch an HP-12CP with a ten-feet pole.

If HP collecting means having to acquire, pay for, and pretend that one likes, such filthy products, I'm extremely happy having turned to collecting vintage Sharp machines instead. That's quality, man.

Best regards from V.

Re: Worst case of wishful thinking

*Message #16 Posted by **tony** on 19 July 2003, 3:28 a.m.,*
in response to message #15 by Valentin Albillo

Valentin - I live in hope. For me the 12CP is quite close to being useful, in spite of it all. I know HP sort of out-sourced it, but as it is branded "hp" I assumed they must take an interest in its quality.

I will agree with you if there is no replacement, or if they publically just pretend it is wonderful, but I like to give them a second chance.

Re: Worst case of wishful thinking

*Message #17 Posted by **Ernie Malaga** on 19 July 2003, 3:20 p.m.,*
in response to message #16 by tony

> Quote:
>
> Valentin - I live in hope.

"Blessed be those who hope for nothing, for they shall not be disappointed."

-- Murphy's Laws

Like you, I used to hope that HP would wake up and smell the coffee. It hasn't. It isn't. And, more than likely, it won't. I have no choice but to side with Valentin.

-Ernie

Sharp

*Message #18 Posted by **bill platt** on 19 July 2003, 10:49 p.m.,*
in response to message #15 by Valentin Albillo

Hi Valentin,

Do you have one of these?

http://home.earthlink.net/~plattdesign/

It is really built like a tank, and running fine.

regards,

Bill

Re: Sharp

*Message #19 Posted by **Valentin Albillo** on 21 July 2003, 4:24 a.m.,*
in response to message #18 by bill platt

Thanks for bringing it to my attention, but I only collect machines I intend to use and write programs for, and those are always high-end models, which in the case of the Sharp machines means programmable in BASIC, from the Sharp PC-1211 upwards.

The only exception is a wonderful Sharp EL-5101, which can accept an 80-step algebraic formula but it's not fully programmable. Not that it matters at all, as both this model and the rest of its family (EL-5100, 5100S, etc) are arguably the most beautiful calculators ever released.

Best regards from V.

Call off your dogs, guys!

*Message #20 Posted by **Karl Schneider** on 19 July 2003, 1:53 a.m.,*
in response to message #1 by tony

Y'all --

Despite the modest numbers involved, this problem is anything but numerically "routine"! Furthermore, the ratio of interest paid to principal is 36:1 (10x360 / 100)-- not very realistic.

Tony's challenge:

> Quote:
> ---
> If you have an unemployed 12cP, see if it will solve for i for this transaction:
>
> ```
> f CLEAR FIN
> 360 n
> 100 PV
> 10 CHS PMT
> i
> ```
> ---

Filling in some "blanks" in the problem:

```
FV = 0
1 pmt/yr (if not using 12C/P)
END mode for payments
```

I, like others, got quick answers of 10% interest, using the 17Bii, 48G, and 49G (my 12C is at my workplace). However, just by doing the cash flow, you will see that exactly 10% is NOT a valid solution. The actual solution is just under 10%, by some amount not representable by the number of working digits in the calculators.

-- At 0% interest, only 10 payments are required, so 360 payments causes an overpayment of, e.g. $3500.

-- At 9% interest, amortization still results in overpayment, after which the interest (now being paid to the borrower) explodes into a FV of $3.3 x 10^14!

-- At 10% interest, $10 accrues on the $100 principal, matching the $10 payment for the period. At this rate, the principal will NEVER get paid. (Regrettably, some people get into credit-card traps like this.)

On the 17Bii, 9.99999999999% is as close as one can enter to 10%, resulting in an FV of 79,500 -- not very close.

If N = 285 payments, however, the 17Bii gives i = 9.99999999998%, which gives an exact solution.

So, in short, the "classic" units quickly give a very close, but incorrect answer to Tony's problem, while the 12CP gets lost trying to arrive at the unreachable correct answer. The former approach is certainly more "graceful" and therefore preferable, but we shouldn't call the 12CP incompetent solely on the basis of this problem.

-- Karl

Re: Call off your dogs, guys!

*Message #21 Posted by **tony** on 19 July 2003, 3:19 a.m.,*
in response to message #20 by Karl Schneider

Almost any tvm problem represented on a finite digit mantissa/exponent machine has the characteristics you mention - more than one solution for one of the parameters, either just in units in last place, or in the large. That's the nature of compound interest and the software has to handle it. The example i gave is just the tip of the iceberg.

12CP TVM algorithm and Tony's example

*Message #22 Posted by **Karl Schneider** on 20 July 2003, 3:26 a.m.,*
in response to message #21 by tony

Tony stated,

> Quote:
>
> Almost any tvm problem represented on a finite digit mantissa/exponent machine has the characteristics you mention - more than one solution for one of the parameters, either just in units in last place, or in the large. That's the nature of compound interest and the software has to handle it. The example i gave is just the tip of the iceberg.

I agree with your sentiments, and believe that some sophistication was lost in the 12CP's TVM algorithm. The original HP models handled these "impossible-to-solve-accurately" cases gracefully by provided the closest possible answer, then stopping. The 12CP, by contrast, probably toggles *ad infinitum* between two or more nearby results that aren't good solutions.

However, the example you provided is not quite "elementary" (as you suggested), or "routine", as Thomas Cox suggested. In fact, the quick answers other calculators provide are *not correct* within reasonable accuracy. The *calculated* future value in your example is extremely sensitive to small changes in the interest rate, making the interest value literally impossible for the machines to find, using their built-in financial equations with the number of significant digits available.

The "closest possible answer" of interest rate provided by the 12C and other originals in this example and in similar ones, is the one at which accrued interest balances the payment:

```
i = -PMT * 100 / PV
```

Using this solution for "i", FV = -PV can correctly be calculated for the 17Bii (although FV = 0 was originally requested); the 12C will incorrectly calculate FV = 0.

Using the calculated value of "i" and FV = 0, neither the 12C nor the 17Bii will be able to calculate N, and they will tell you with an error message. Does the 12CP? -- probably not.

Can you provide a specific example in which the 12CP cannot calculate a correct answer that it ought to be able to, or takes way too long to do so? I would suggest trying a more-conventional TVM problem, with total payments not greater than 5x the principal.

Regards from Karl S.

Re: 12CP TVM algorithm and Tony's example

*Message #23 Posted by **tony** on 20 July 2003, 4:02 a.m.,*
in response to message #22 by Karl Schneider

Ok here is one with PMT=0 where the 12CP gives the wrong answer for i.

n=E7 i=E-14 PV=1 PMT=0 solve for FV=-1.000000001

resolve for i. the 12CP instantly gives zero exactly. the 12C gold gives 9.999999995E-15

So, the 12CP thinks that n*PMT+PV+FV=0, which is incorrect. Here we see the opposite extreme to the 12CP providing no answer in a finite period of time - a wrong answer instantly.

Instead of the perpetuity, which was an example of a loan, let us make this one a savings case with PMT=1, and set "END". Solve for FV=-10,000,001.01 (requires i=E-14)

Resolving for i on the 12CP takes 0ver 10 minutes and gives E-13. resolve for FV again and you get "5" instead of "1' in the last place.

By contrast the gold 12C gives 1.999999799E-14 in 4 seconds. This is an excellent answer as *all* i =>E-14 and under 3E-14 give the FV, and 2E-14 is in the middle of this range.

The 12CP takes over 10 minutes to give a really silly answer.

Re: 12CP TVM algorithm and Tony's example

*Message #24 Posted by **Victor Koechli** on 20 July 2003, 5:39 p.m.,*
in response to message #23 by tony

Here are the results from my 48GX Rev. R (1995):

- 0 for i instantly for the first example
- -10'000'001.005 for FV, then 9.9999989975E-15 for i (again instantly) for the second example. So i, in this case, is just below the lower limit of acceptable values.

I guess this, again, is a limited precision issue.

I'm no expert, but is there a way to set up calculations like these differently, so we could get better answers?

Regards, Victor

Re: 12CP TVM algorithm and Tony's example

*Message #25 Posted by **tony** on 20 July 2003, 4:20 a.m.,*
in response to message #22 by Karl Schneider

sorry I am not too used to using this message board. what I wrote was not just "sentiments". No compound interest problem is really more elementary that any other, but that one is pretty simple, as they go. I really don't know what you mean by realistic - everybody's use is different. TVM is just a calculating engine. If you can input a problem it is nice to be able to resolve for a variable. That's all. It's not a question of "sophistication" is it? It's just a bit strange to get no answer or a wrong answer, particularly where the 12C gold was/is just fine.

You asked for me to provide examples where the 12CP is slow at solving for i. Is that necessary? Just about anything where PMT#0.

BTW I just posed the original case to see if anyone else with a 12CP could try it - Im hoping for a new ROM to appear. It just seemed a good test example. It had FV=0. Well it could have been almost anything I guess, as it gets discounted heavily. Why do you call it unrealistic?

Re: 12CP TVM algorithm and Tony's example

*Message #26 Posted by **tony** on 20 July 2003, 6:02 a.m.,*
in response to message #22 by Karl Schneider

Hi Keith - me again. You really raised a whole lot of issues. Forget about the FV thing. The PV is not at all sensitive to i. You mention N - of course yes that OFTEN is completely inteterminate. None of this is anything special. It's all just standard compound interest, which TVM is designed to handle. It's a question of functionality only, over the full range of problems. if you can input an i and solve for anything else then you should be able to re-solve for i - if not there has to be a well-defined reason. In the perpetuity case there is no good reason for the 12CP failure to resolve for i.

If you think the 12CP is toggling between two values and just cannot decide which one to choose, which values might these be?

You said i suggested that the perpetuity thing was elementary, and someone else suggested the same, but you think it is complex. Ok here is a challenge for you. Give us an example that you think is elementary and I'll see if i can convince you it is really incredibly complex. All the problems are really much of a muchness in this respect.

The reason i said to forget about the FV thing above is that I know that when the 12c solves for i in that case it does NOT use the FV as a focus - it uses the PV. Looking at that one again i would call it not just elemntary, but elementary in the extreme. It is a classic case where the answer is blindingly obvious. It is really sad that the 12CP fails miserably. Oh, dear, I'm starting to agree with Valentin!!!!

Thanks for your post! keith i hope you don't work for HP or Kinpo!!<G>

I wish this discussion board had an e-mail list option.

A response to Tony's spewings [LONG]

*Message #27 Posted by **Karl Schneider** on 20 July 2003, 6:06 p.m.,*
in response to message #26 by tony

Tony,

In your last three posts, I can see that you have a certain amount of knowledge about using a TVM program, but I didn't see very much clear analytical thought or coherent writing. Some of your statements even suggest a lack of maturity.

For the record, the name is "Karl", not "Keith" or "keith". No, I don't work for HP or Kinpo, but I have extensive experience with software that is based on iterative solution processes (power flow on an electric network), and passed a course in economic analysis that included TVM and cash-flow analysis.

I would suggest that you deepen your own understanding of the mathematics of TVM, by studying the 12C manual, working through cash flows step-by-step, and perhaps even reading a textbook such as "Engineering Economic Analysis".

I don't have a 12CP, and doubt that I would buy one. It looks like an inept "upgrade", with unrefined algorithms, as well as design changes and functionality enhancements that are ill-conceived.

Here are my responses to just a few the statements in your last three posts:

> Quote:
>
> Ok here is one with PMT=0 where the 12CP gives the wrong answer for i. n=E7 i=E-14 PV=1 PMT=0 solve for FV=-1.000000001 resolve for i.

Good grief! I asked for a "realistic" application of TVM, and you provide an example with 1 million payments at an interest rate of 0.00000000000001%! That doesn't look anything like an auto loan or mortgage in the real world. Granted, it's interesting to "test the robustness" of the software, but we should be determining how well the 12CP works as an everyday tool.

> Quote:
>
> the 12CP instantly gives zero exactly. the 12C gold gives 9.999999995E-15 So, the 12CP thinks that n*PMT+PV+FV=0, which is incorrect. Here we see the opposite extreme to the 12CP providing no answer in a finite period of time - a wrong answer instantly.

The 17Bii also gives i = 0.00, but this may just represent a choice not to display decimal digits of "I%YR" beyond its limits of precision. BTW, n*PMT+PV+FV=0 is correct if i = 0.

> Quote:
>
> Instead of the perpetuity, which was an example of a loan, let us make this one a savings case with PMT=1, and set "END". Solve for FV=-10,000,001.01 (requires i=E-14)

No, no, no. "END" refers to payments at the end of the period, as is done for loans (e.g., purchase of auto and homes). "BEGIN" refers to payments made at the beginning of the period, as is done for leases (e.g., autos and apartments). It's in the manuals.

> Quote:
>
> sorry I am not too used to using this message board. what I wrote was not just "sentiments". No compound interest problem is really more elementary that any other, but that one is pretty simple, as they go. I really don't know what you mean by realistic - everybody's use is different. TVM is just a calculating engine. If you can input a problem it is nice to be able to resolve for a variable. That's all. It's not a question of "sophistication" is it? It's just a bit strange to get no answer or a wrong answer, particularly where the 12C gold was/is just fine.

I can't find a coherent point in that army of words, but I see what you're trying to say. Your original example was one in which *none* of the calculators is able to compute the exact answer that solves the equation to a close tolerance, because it requires more significant digits than they have. Your original example had N*PMT = 36*PV. That amounts to interest charges 35 times as high as the amount borrowed! Would you buy a house for $200,000, then pay $7 million in interest? Your example was computationally "stiff" (hard to solve) because of this, and it was realistic only to a loan shark.

"Sophistication" in the algorithms involves identification of situations like this, and handling them gracefully, even if the exact answer that meets desired accuracy cannot be obtained with the equations and available precision. The 12CP appears to not to have this sophistication -- it seems to

execute the standard equation in an eternal quest for the unobtainable precise answer. The other models pragmatically give the best answer they can, and then stop. "Sophistication" is not equivalent to "complexity".

I would suspect that the 12CP handles routine, conventional problems about as well as the others. Here's one (my auto loan from 1986 -- 12% annual interest (!) with monthly payments):

n=48; i=1; PV=8400; FV=0. Solving, PMT=-221.204218. Can the 12CP re-solve for "i"?

How about this one (a 30-year mortgage at contemporary low interest rates):

n=360; PV=175,000; PMT=-1000; FV=0. Solving, i = 0.46316% (or, 5.558% per year, nominal)

> Quote:
>
> Hi Keith - me again. You really raised a whole lot of issues. Forget about the FV thing. The PV is not at all sensitive to i. You mention N - of course yes that OFTEN is completely inteterminate. None of this is anything special. It's all just standard compound interest, which TVM is designed to handle.

Huh?? It's true that PV is not sensitive to "i" in that problem, but I don't believe that N "OFTEN is completely inteterminate *(sic)*" -- only in these examples where the function f(n,i,PV,PMT,FV) = 0 is not solved to a close tolerance in the first place.

> Quote:
>
> If you think the 12CP is toggling between two values and just cannot decide which one to choose, which values might these be?

i = 10.00000000 and i = 9.999999999. Compute FV for those values, using a 17Bii or a 10B if you have one.

> Quote:
>
> You said i suggested that the perpetuity thing was elementary, and someone else suggested the same, but you think it is complex. Ok here is a challenge for you. Give us an example that you think is elementary and I'll see if i can convince you it is really incredibly complex.

That doesn't even deserve a response, wise guy.

> Quote:

> All the problems are really much of a muchness in this respect.

Say what???

> Quote:
>
> The reason i said to forget about the FV thing above is that I know that when the 12c solves for i in that case it does NOT use the FV as a focus - it uses the PV.

In order to solve for any one of the five variables, fixed input values of each of the other four is required. It must solve f(n,i,PV,PMT,FV) = 0 for "i". Only in the case of "i" must this be done iteratively; direct anlgebraic equations can be written for the other four variables. That's why they solve faster.

> Quote:
>
> Looking at that one again i would call it not just elemntary, but elementary in the extreme. It is a classic case where the answer is blindingly obvious.

Better look at it again, Tony. Run the cash flows -- A value of "i" such that payment = accrued interest means that FV = -PV, not FV = 0.

> Quote:
>
> Oh, dear, I'm starting to agree with Valentin!!!! Thanks for your post! keith i hope you don't work for HP or Kinpo!!<G>

Valentin is a lot more intellectually coherent that you are, Tony. Grow up, or at least get some sleep before you post again.

> Quote:
>
> I wish this discussion board had an e-mail list option.

"keith", here, does not.

Re: A response to Tony's spewings [LONG]

*Message #28 Posted by **tony** on 20 July 2003, 9:39 p.m.,*
in response to message #27 by Karl Schneider

Karl, very sorry i annoyed you and called you the wrong name. A total mistake!!! I am used to writing e-mail offline. I hestitate to write any more, in case i give the wrong impression. No worries. I'm real happy to email you in private - just email me at th@csi.com. I think i was tired when i wrote my posts. Technically they are not totally unsound. About n being indeterminate:- it is when PV=-FV or FV=-PV or, for PMT @ END mode, when PMT/i is between -PV and FV. It is surprising how often this happens. Also n is indeterminate if i=0 and PMT=0. BTW this is different to the error 5 conditions given for n in the 12C (and 12CP) manual - there they say PMT<=-PV*i which is true for the "=", but not for the "<" unless FV is less than -PV. You keep mentioning FV in that perpetuity case - it is the volatility of the PV that you have to look at. I should say I have studied, used and written about compound interest a lot over the last 30 years, not that that in itself is any guarantee that there might be any actual truth in what i write. To be honest, it can be a very boring topic - which means hardly anyone takes the time to get it right, because nobody is really interested anyway.

I don't want to argue with you in detail so i thought i would make a few general points. Is that OK? If you want to write about me like you have done in your post I would appreciate it if you did it to me personally in a private e-mail and not too much more in public. is that OK?

I really didn't realise my writing was so bad as you mention. It's amazing what strong feelings a TVM program can bring out!!!!!! I couldn't believe it when i saw the subject wording you used.

I must have given the impression i was being too clever or something in giving those examples. I'm sorry you didn't like them. They are realistic for some problems. i still have a letter from the consultant behind the 12C written 20 years ago where n=E7 is used to make the 12C do a calculation using continuous payments.

Repartee' with Tony about TVM

*Message #29 Posted by **Karl Schneider** on 20 July 2003, 11:14 p.m.,*
in response to message #28 by tony

All --

I admit to being a bit miffed about the "hope you don't work for HP or Kinpo" remark, but I admit that I was overly snarky, and made several factual errors in my last post. I see them; no need to point them out. I wanted to post an edited version, but Tony replied first.

Tony and I will smooth it over.

Best Regards,

Karl

None of my business, but...

*Message #30 Posted by **Vieira, Luiz C. (Brazil)** on 20 July 2003, 11:55 p.m.,*
in response to message #29 by Karl Schneider

Hi;

I cannot help myself not congratulating you both. I admire such respectfull actions. Please, take my post as sincere admiration for such nobel gesture of yours. I think most problems in the whole world would never prevail if such mutual respect is taken as priority.

Be well.

Luiz (Brazil)

(if any of you believe this post of mine should be removed, the password is 12345)

Re: None of my business, but...

*Message #31 Posted by **tony** on 21 July 2003, 12:07 a.m.,*
in response to message #30 by Vieira, Luiz C. (Brazil)

Luiz, thanks for the post! Kudos more to Karl than me as I was the one who annoyed him. Cheers, Tony

Re: Repartee' with Tony about TVM

*Message #32 Posted by **tony** on 21 July 2003, 12:04 a.m.,*
in response to message #29 by Karl Schneider

Karl - no worries. Thanks for your post. I did put a <G> after asking if you worked for HP. BUT I know a <G> often goes mis-read. Cheers, Tony

Re: A response to Tony's spewings [LONG]

*Message #33 Posted by **tony** on 20 July 2003, 10:57 p.m.,*
in response to message #27 by Karl Schneider

Karl - I forgot to say that i for the loans you mention would probably take about 45 seconds to resolve on the 12CP. Also perhaps i have been not forthcoming enough on that perpetuity example - it's just that i have little time to write. Suppose i come into money - in the form of $10 a month for 30 years. However this is a very risky stream of income, perhaps related to gold production in the far east. How do i value it? I have to use a high interest rate - even as high as 10% a month. There we have it. The high interest rate reflects to low *probability* of actually

receiving the income stream. Is that so unrealistic? In fact in some countries interest rates are generally quoted "per month". They can be a lot higher in countries other than the USA.

Funny, my beta 12cp solves the perpetuity problem in 3 minutes!

*Message #34 Posted by **Gene** on 21 July 2003, 10:16 a.m.,*
in response to message #22 by Karl Schneider

Have no idea why!

It solves 360 N; 100 PV; -10 PMT; 0 FV

in about 3-4 minutes. Returns 10 as i.

This is the unit that turns off whenever a program hits a R/S or GTO 0000 instruction!

Go figure!

New units have fixed this "OFF" problem...

*Message #35 Posted by **Vieira, Luiz C. (Brazil)** on 21 July 2003, 12:21 p.m.,*
in response to message #34 by Gene

... but it cost a "reasonable" price :)

Edited: 21 July 2003, 12:21 p.m.

Re: Funny, my beta 12cp solves the perpetuity problem in 3 minutes!

*Message #36 Posted by **tony** on 22 July 2003, 10:41 p.m.,*
in response to message #34 by Gene

Thanks for testing it on your unit Gene - lucky the test didn't take too long ;-) Another funny thing is the 12C makes rather hard work of this one - it takes 25 seconds. But the 38C and 37E do it in 4 seconds flat (they must have better initial guesses, whereas I think the 12C just uses 1/n as the guess for i).

Actually when I ran this one on the 12CPt I was expecting it to take about 4 minutes - couldn't believe it when it just kept going.

Again: Accuracy × Internal # of digits (edited)

*Message #37 Posted by **Vieira, Luiz C. (Brazil)** on 22 July 2003, 11:23 p.m.,*
in response to message #36 by tony

Hi Tony, Gene, guys;

after reading your post mentioning that both HP37 and HP38 (both probably share the same basic firmware) need 4 seconds instead of 25 in the HP12C, 3 minutes in Beta HP12cP and some hours in the commercial HP21cP, I felt curious about one thing: do Spices have the same internal accuracy that Voyagers have? I mean, if original HP12C needs 25 seconds and both Spices need only 4 seconds, would they have different internal accuracy? If there are fewer digits to compare, the same iteractive loop may converge in less counts. In the HP12C, amortization has its accuracy in accordance with display settings, i.e., number of digits. I did not test so far, but I think that the more digits you set, more time is spent to compute a more accurate result.

Maybe it's just a wild guess, maybe clock (frequency) is the answer. But after what happened to the HP12cP, I'm trying to collect information.

My thoughts, only.

Luiz (Brazil)

Edited: 22 July 2003, 11:33 p.m.

Re: Again: Accuracy × Internal # of digits (edited)

*Message #38 Posted by **tony** on 23 July 2003, 6:04 a.m.,*
in response to message #37 by Vieira, Luiz C. (Brazil)

Luiz, I am not sure about internal accuracy, but suspect Spice and Voyager are very similar. My guess is that for this TVM example, the 38C uses a better starting point than the 12C. Normally their i-solving performance is pretty similar - taking 15 seconds or so. I remember reading somewhere that HP put a lot of effort into the initial guess of pre-12C TVM. But I think the 12C uses an improved algorithm (more powerful at converging), which is not as dependent on the initial guess... but not independent thereof - in fact the 12c can take up to 40 seconds where it should really take about 4.. ,and on the 12C they don't really worry too much about the initial guess, probably using something like 1/n. Earlier TVM really needed an accurate starting point as they were slower to converge.

Actually you can pretty much "see" the 12C i-solving algorithm in the "*I" routine in the 41C "Advantage ROM" - which is more nicely coded than the "Finacial Decisions Pac". The "*I" code follows the methods outlined in Prof kaplan's "Maths in the Sand".

I have thought about your earlier post of a few days ago - about the extra accuracy of the 12CP chip, and also Valentin's post about Prof. Kaplan's "Maths in the Sand", and the hypothesis that somehow Kinpo were able to "drop" the 12C gold code into the new chip. I am not

a hardware guy, or a low level software guy, but it is quite conceivable that the 12C code includes a routine for EXPM1 for example - and we can be sure Prof. Kaplan would not have wasted any code space on that - it would compute to the required accuracy and no more. If Kinpo left that unchanged and allowed it to run on more digits than intended something is bound to go wrong. The algorithm relies on an accurate EXPM1, or some co-relative, just to compute accurate values.

I always thought the 12C iterated on '1+i/100' (or its inverse) , and that explained the way it truncates its answers (in an entirely practical way) and also its speed. If the 12CP is doing the same it will delve into realms of accuracy the rest of the 12C code may not be "in harmony" with. It does *appear* to do just that from some examples I have tried - my guess is that the 12CP chip has about 4-5 digits of extra internal accuracy avaibale (compared to the 12C).

This hypothesis does almost seem to explain some of the 12CP behaviour - like where it actually produces a wrong answer - a very bad sign. Maybe when it takes forever it is wandering up and down a broad step function, where it should be on a nice smooth curve.

I don't think it explains all the peculiarities I've seen, but that could be because of my limited imagination. Also I could be quite wrong about how scalable the 'EXPM1' routine might be. For all I know it may be fine, or Kinpo consultants tried to enhance it, but the end result is, well, to be honest, almost unusable when solving for i.

Also, surely HP are aware of this problem and yet new units are still being pushed onto the market. I am maybe very naive to hope for a new ROM. I did actually hear that HP were going to make some sort of "announcement' about the 12CP, but it didn't happen, yet ...

Cheers, Tony

Are you joking ?

*Message #39 Posted by **Valentin Albillo** on 23 July 2003, 7:24 a.m.,*
in response to message #38 by tony

Tony posted:

" ...and on the 12C they don't really worry too much about the initial guess, probably using something like 1/n"

Nope and nope. They *do* worry VERY MUCH about the initial guess, and they *do not* use *"something like 1/n"*. Just look at this paragraph taken from the same Mathematics Written in Sand document you mention but that you don't seem to have paid proper attention to (the paragraph does refer to the HP-92 but applies equally well to the HP-12C, which includes even more refinements to make it work for *non-integer n*, basically consisting in iterating over the logarithm instead of the variable proper):

"To cope with huge n on the HP-92 , Roy and I approximated the root x of the financial equation *asymptotically* (as n goes to infinity), and used the leading term as a first guess for the iteration. Despite having to recognize several cases, the

approximation is quick and, when n is large enough that it matters, accurate to over *five significant decimals*."

So, you see, they worry enough that they generate and use an *asymptotic expansion* for the relevant equation, then consider *several distinct cases*, and they are rewarded by an approximation accurate to FIVE (!!) significant decimals, to begin with. I'm sure many financial models would give their souls to be able to get so accurate an initial *approximation* that most would consider it the outright answer. Obviously, this is a far cry from *"don't really worry too much"* and an even farther cry from *"something like 1/n"*.

Mr. Kahan goes on to say:

"Further details are not needed to make my point: Every day, hundreds of thousands of people employ powerful financial calculators that are convenient, fast and reliable because of Physical, Chemical, *and now Mathematical technology* more intricate than they imagine."

Yes, it *was* that way, then. That is, till HP did throw everything to the trash bin, 12C source code included, as well as the ultra-expert attention to detail that made them their reputation, and subcontracted a Taiwanese *cheapo* to put something on the market at the minimum possible cost.

QA ?? Who cares !! As long as there are users like yourself, not minding shelling out their hard-earned bucks for a pathetic piece of crap, and then wasting their time trying to understand why said crap doesn't work like it should, HP will feel justified in acting like they do. Not that it matters, really,

The proper thing you should have done is to return that *thing*, perhaps you can still get your money back.

Best regards from V.

Re: Are you joking ?

*Message #40 Posted by **tony** on 23 July 2003, 5:23 p.m.,*
in response to message #39 by Valentin Albillo

Valentin, no I was not joking at all. I can *tell* by doing examples that the 12C does not have the same initial guess as pre-12C HP Financial calculators. Note carefully that the *12C* itself is *not* mentioned until after the word "Later" below - this is significant:

"Dennis and I used related transformations to solve related equations for Internal Rates of Return on the hp-38E and C , whose [IRR] key will cope with over 2000 cash-flows. Later, to cope with a revised version of the financial equation above that, unlike the original, makes sense when n is not an integer, Rich and I used yet another transformation in the hp-12C ; we used ln(y) instead of y as the independent variable in the equation above with terms cjyj , and applied Newton's iteration to its logarithm. Although

each iteration cost now more time than before, the theorem continued to guarantee convergence which was rapid from every starting point regardless of n . Further details are not needed to make my point:"

Note that now Prof. Kahan suddenly makes the additional remark that convergence is "rapid from every starting point regardless of n." I say suddenly because in the previous paragraph he is talking about the HP92 an the problem of huge n. Note he carefully lists the machine names and the 12C is excluded.

The 12C has quite a different i-solving "speed profile" to pre-12C calculators, consistent with it not using any asymptotic guesses.

Cheers, Tony

Re: Are you joking ?

*Message #41 Posted by **tony** on 23 July 2003, 7:20 p.m.,*
in response to message #39 by Valentin Albillo

Valentin, here is evidence to show that the 12C does not use the same asymptotic guess as the 38C. Consider a loan with PV=100 and PMT=-10 in arrears, and FV=0. The asymptotic guess for i is 10. Here are the solution times in seconds on the 12C and on the 38C, as n gets larger:

n...12C...38C

E2...20...10

E4...30....5

E8...40....5

The 38C gets faster as the problem gets more "asymptotic", indicating it starts closer to the asymptotic answer. The 12C gets slower, indicating that it starts further and further *away* from the answer.

Cheers, Tony

Re: Are you joking ?

*Message #42 Posted by **tony** on 23 July 2003, 10:16 p.m.,*
in response to message #39 by Valentin Albillo

Valentin,

> Tony wrote: " ...and on the 12C they don't really worry too much about the initial guess, probably using something like 1/n"

> Nope and nope.

I still think the answer is actually yes and yes, for the 12C.

> They *do* worry VERY MUCH about the initial guess, and they *do not* use "something like 1/n".

> Just look at this paragraph taken from the same Mathematics Written in Sand document you mention but that you don't seem to have paid proper attention to (the paragraph does refer to the HP-92 but applies equally well to the HP-12C, which includes even more refinements to make it work for non-integer n, basically consisting in iterating over the logarithm instead of the variable proper):

I know that paragraph does *not* apply to the 12C. It might appear to from your reading, but the 12C is not mentioned. The hp-92, -37E, -38E and -38C are mentioned.

> "To cope with huge n on the HP-92 , Roy and I approximated the root x of the financial equation asymptotically (as n goes to infinity), and used the leading term as a first guess for the iteration. Despite having to recognize several cases, the approximation is quick and, when n is large enough that it matters, accurate to over five significant decimals."

here is the next sentence, which you omit:

"Therefore, nobody has to wait more than about a dozen seconds, long enough for fewer than 100 multiplications, after pressing [i] on the hp-92, -37E, -38E or -38C , no matter how big n may be."

> So, you see, they worry enough that they generate and use an asymptotic expansion for the relevant equation, then consider several distinct cases, and they are rewarded by an approximation accurate to FIVE (!!) significant decimals, to begin with. I'm sure many financial models would give their souls to be able to get so accurate an initial approximation that most would consider it the outright answer. Obviously, this is a far cry from "don't really worry too much" and an even farther cry from "something like 1/n".

Oh yes i agree that is a far cry from what i wrote. I wrote about the 12C. That applies explicitly to pre-12C.

It is almost trivial to determine asymtotic guesses for TVM problems, and the accuracy of course gets better "when n is large enough that it matters".

>Mr. Kahan goes on to say:

>"Further details are not needed to make my point: Every day, hundreds of thousands of people employ powerful financial calculators that are convenient, fast and reliable because of Physical, Chemical, and now Mathematical technology more intricate than they imagine."

> Yes, it was that way, then.

Agreed. But the 12C itself is not a great example. If you set up n=10,PV=10,PMT=-1 and FV=0 you have a transaction with interest rate zero. Try it on the 12C. It takes *15 seconds* and returns this in the display: -7.757450 -12 Try it on the 38C - solving for i gives an instant zero.

> That is, till HP did throw everything to the trash bin, 12C source code included, as well as the ultra-expert attention to detail that made them their reputation, and subcontracted a Taiwanese cheapo to put something on the market at the minimum possible cost.

That is the story we are told about the source code. But, one never quite knows. Maybe HP didn't manage the source code ownership properly. I'm sure it will be sitting on a CD ROM somewhere.

> QA ?? Who cares !! As long as there are users like yourself, not minding shelling out their hard-earned bucks for a pathetic piece of crap, and then wasting their time trying to understand why said crap doesn't work like it should, HP will feel justified in acting like they do. Not that it matters, really,

Fair enough, you are welcome to your opinion. No worries. I do care, I think. And, apart from the built-in i-solving, I find the 12CP more useful than the 12C, because of the 253 program lines. Think of the fun you could have with all those lines Valentin ;-)

> The proper thing you should have done is to return that thing, perhaps you can still get your money back.

Thanks for you advice - really, you made me think twice<G>

Cheers, Tony

Overkill

*Message #43 Posted by **Valentin Albillo** on 24 July 2003, 5:09 a.m.,*
in response to message #42 by tony

Frankly, Tony, I think yours is a case of overkill.

If you're right (which is debatable), then you're right, point taken.

But posting THREE LONG messages in a row to my single one, before I get even a chance to reply to the very first one, is overkill, and makes me think you couldn't decide on your answer in the first place. I was thinking about replying to them, but frankly, seems to me that you tend to discuss everything too passionately and don't know when to stop (just look at this very thread), and I'm not for entering never-ending discussions with anyone, free time is too scarce and valuable to waste it that way.

I suggest that in the future you should begin by making up your mind about what you really want to say and how to say it, and post a single, to-the-point reply. If afterwards you feel that something needs adding or changing, edit it by all means, but don't post again re-hashing once more all your arguments.

Else, posting one long message, then another, then another, IMHO only helps to give a bad impression on your arguing skills and makes the potential reader less eager to read your posts, present and future.

Best regards from V.

Re: Overkill

*Message #44 Posted by **tony** on 24 July 2003, 9:34 a.m.,*
in response to message #43 by Valentin Albillo

Valentin, fair enough. Maybe I simply should have replied "No, I am not joking". ;-)

Cheers, Tony

Re: Again: Accuracy × Internal # of digits (edited)

*Message #45 Posted by **bill platt** on 23 July 2003, 9:49 a.m.,*
in response to message #37 by Vieira, Luiz C. (Brazil)

Luiz,

I am sure you probably all ready know this, but just the other day, I decided to compare some of my calculators regarding precision. So I did a simple trick of taking the sine of a number, and then taking the sine of that reuslt, etc, for lots of iterations (say 20 or 30).

You end up with a really small number. So, my results "grouped" my calculators as folows, regarding the resulting manitssa:

Group A) HP-45

Group B) HP 15c, HP 11c

Group C) HP 32sii, HP 20s, HP48GX

Note that the displayed mantisssa of the 48GX is larger than those displayed on the Pioneers; however, the round-off was at the last digit, so they appear to be coming the same internal precision.

By the way, the difference between these groups, after 26 iterations, was at the fifth or seventh mantissa position (I can't remember now). That is pretty darn close.

Anyway, I am afraid that this is probably not really news after all.

1234 to delete.

Regards,

Bill Platt

Limit of Sin(Sin(Sin(...)))

*Message #46 Posted by **Valentin Albillo** on 24 July 2003, 4:48 a.m.,*
in response to message #45 by bill platt

Hi Bill:

Bill posted:

"I did a simple trick of taking the sine of a number, and then taking the sine of that reuslt, etc, for lots of iterations (say 20 or 30). You end up with a really small number"

In case you are interested, the limit of applying *infinitely many* sine functions to any real number is *zero*, i.e:

```
lim [ sin(sin(sin(...sin(x)...))) ] -> 0
```

though the convergence to zero is *extremely* slow. It begins relatively fast, but after several thousand sines it slows to a crawl. This is easily seen considering the Taylor series expansion for sin(x):

```
sin(x) = x - x^3/6 + ...
```

where you can see that for very small x, sin(x) is *nearly identical* to x, except for an extremely tiny error term (- x^3/6 + ...). If x is very small, (- x^3/6 + ...) is *much smaller*, and that is the *only* thing that gets you nearer to zero as you take yet another sine. So the rate of convergence gets slower and slower the nearer to zero you are.

Also, a very curious fact is the shape of the resulting function y=sin(sin(sin(...sin(x)...))) as you take more and more sines. With just one sine, you get, of course, a perfectly sinusoidal curve, with amplitude 1. But as you apply more and more sines, the shape gets *squarer and squarer*, with smaller amplitude. The limiting shape tends to a *perfect square wave* with an amplitude tending to *zero*.

If you've got a PC, or even some reasonably fast programmable handheld with a decent graphics screen (say a SHARP PC-1350, 1360, or 1600), give it a try ! It's amazing to see the wave turning more and more square, though you'll need to re-scale because its amplitude also gets smaller and smaller. This is a very rewarding empirical result, and it's not difficult to prove it theoretically as well.

Best regards from V.

Re: Limit of Sin(Sin(Sin(...)))

*Message #47 Posted by **bill platt** on 24 July 2003, 5:59 p.m.,*
in response to message #46 by Valentin Albillo

Valentin,

Thanks for your excellent and informative reply!

But, you are taking the sine in RADIANS, yes? I was doing this but in DEGREES, which of course gives a totally different sort of result and decays much more rapidly.

I have not yet plotted---actually I have too much work to do before going on holiday Saturday----but I maybe will try then?!

Best regards,

Bill Platt

somebody get me a mathematician ... limit sin(sin(...

*Message #48 Posted by **Norm** on 24 July 2003, 7:16 p.m.,*
in response to message #47 by bill platt

Although we presume it will very slowly get to zero, there are mathematical formulas for that. It's possible that it will NEVER get to zero, and instead the ultimate limit is something above zero.

I'm not saying either way, because i dont like that kind of math work. But a mathematician could prove whether or not it reaches zero.

YES, you'd want to do that in radians.

Re: somebody get me a mathematician ... limit sin(sin(...

*Message #49 Posted by **Werner Huysegoms** on 25 July 2003, 4:22 a.m.,*
in response to message #48 by Norm

No, it will reach zero... For if it doesn't, and the limit would be some number a>0, then sin(a)<a - contradiction.

that's not a proof.

*Message #50 Posted by **Norm** on 25 July 2003, 5:40 p.m.,*
in response to message #49 by Werner Huysegoms

Common sense would suggest that it does go to zero, as you are saying.

But what you just said does not constitute a mathematical proof.

It would be possible to prove it mathematically.

Considering that the Taylor series disappears to the 3rd power, it is possible that maybe it does not get to zero.

I would be interested in seeing a genuine and complete mathematical proof.

Re: that's not a proof.

*Message #51 Posted by **Paul Brogger** on 25 July 2003, 7:49 p.m.,*
in response to message #50 by Norm

I would be interested in seeing a genuine and complete mathematical proof.

I would be MORE interested in watching YOU come up with one!

(Do you mind if I look over your shoulder for a while?)

;^>

Re: that's not a proof.

*Message #52 Posted by **Werner Huysegoms** on 26 July 2003, 12:59 p.m.,*
in response to message #50 by Norm

Alright, second go.

If f(1,x) = sin(x) and f(n,x) = sin(f(n-1,x))

Let lim(n->oo) f(n,x) = a Taking the sine on both sides: lim(n->oo) f(n+1,x) = sin(a) or a = sin(a), or a=0

mathematically correct enough?

Best Regards, Werner Huysegoms

maybe that was a proof, college nightmares

*Message #53 Posted by **NH** on 26 July 2003, 1:59 p.m.,*
in response to message #52 by Werner Huysegoms

Thanks Werner, that is looking more like a proof.

If you were bullsh*ting me I probably wouldn't notice but at least it looks right.

I took some very advanced math in college (trusty HP-34C at my side..... 1981 - 1985) and that included differential equations, calculus in 3 dimensions, LaPlace transforms, Z transforms, and calculus in "n" dimensions.

So I used to know how to prove the limit of something as N went to infinity.

I take great personal pride in the fact that I forgot it all.

However I still get the standard post-college nightmares that I am late for the big test, and I dont know the answers, and I skipped the class for 6 weeks continuous, and I am sitting in the back row taking the test but I

forgot to put on blue jeans so I am wearing only underwear, but I hope that nobody notices (and its all happening at the same time, until I wake up).

YEAH thanks a lot math professors, all that study and it gives me nothing but)*)(*^^%@#% nightmares, and the majority of engineering or other technical degree'd people report similar nightmares after college.

At the present juncture, all that study (not to mention competency) doesn't even produce a stinking income, the Carly Fiorina, the Mafia, the Ford/Firestone, and the Enron goons have pretty well shut down engineering and any decent or otherwise innovative products, and fullest contempt for those who can innovate is now in-session.

Now I have got a brand new nightmare ..... "would you like fries with that?" I have to wonder why I bothered learning all that stuff, I should have simply learned to sell insurance and then I could discontinue perfectly good products in exchange for granting myself christmas bonuses and pay raises.

MBA's also have post-college nightmares

*Message #54 Posted by **Norm** on 27 July 2003, 1:02 a.m.,*
in response to message #53 by NH

Apparently post-college nightmares are based upon the worst-case scenario's that we spend the whole 4 years not letting it happen (I didn't study, I'm flunking out, I'm late to class)....

Those scenario's didn't happen, because we were diligent. Afterwards, we get the nightmares as though we did not have integrity and those things really happened.

M.B.A. POST COLLEGE NIGHTMARES:

* Show up at the wrong fraternity and miss the mandatory hazing of new members.

* Drank so much beer at the frat party that you throw up on the beautiful fraternity gal U wanted to take to bed and then never speak to again.

* The latest $75,000 check from Dad bounced, the day before you are required to take delivery of the new Mazerati at the dealership downtown.

* You forgot to buy off the professor at the dinner party last Saturday, so now you have to take the final exam for real... and of course you dont know the material.

* You need to get into executive management at GE, and you forgot to buy a case of wine for your buddy's dad and now maybe you don't have that in you needed.

OF COURSE, these things didn't actually happen to MBA's, but they get these nightmares because it did not really happen that way.

How about cutting MBAs some slack?

*Message #55 Posted by **Gene** on 28 July 2003, 10:18 a.m.,*
in response to message #54 by Norm

Is this really necessary? I know full well the irritation at the apparently stupid decisions made by some in marketing and those with MBAs with regard to calculators over the years.

But this is starting to get tiresome, at least for me. Should I start abusing engineers? What good will that do?

Legitimate beefs are fine, but let's consider calling off the constant harping. Ok? :-)

Gene

Re: How about cutting MBAs some slack?

*Message #56 Posted by **Axel Poqué** on 28 July 2003, 10:42 a.m.,*
in response to message #55 by Gene

I don't know if this relates to MBAs or marketing, but (at least for me) the main problem of HP (or any other of todays companies) is their focus on shareholder value instead of customer satisfaction (note that I didn't say 'consumer') as their prime indicator for success. And since it is easier to boost shareholder value by reducing costs (laying off people, escpeially those with experience, that is) and selling increasingly larger quantities of increasingly inferior 'products', such inconveniences like quality and good engineering are no longer needed.

Sorry for venting a bit.

Axel

Re: How about cutting MBAs some slack?

*Message #57 Posted by **Gene** on 28 July 2003, 2:18 p.m.,*
in response to message #56 by Axel Poqué

Actually, shareholder value IS the appropriate goal for a company. After all, the company belongs to the shareholders and management is their agent.

However, the problem results when management and/or shareholders focus on the short-term instead of the long-term.

Long-term thinking to increase shareholder value will not short-change customers. You must keep customers happy or you won't stay in business long-term. If you're not in business, shareholders have no value.

That said, a focus on customer satisfaction is of course very important, provided making customers happy fits with adding shareholder value.

For example, customers would be very satisfied with a $500 car price from a manufacturer, but if they made those customers very happy, they'd not make the shareholders very happy.

Another example, shareholders would be very happy with a company selling $30,000 cars made of crap, but since customers would notice this and never return, the shareholders would only be happy short-term.

Has to all fit together. Really can't have one without the other.

Where HP went wrong (or present tense if you like), was by not really knowing their customer. If you don't know what your customer wants, then decisions you make won't make the customers OR shareholders happy.

I'm with Alex, nope, no slack (your speaking Swahili)

*Message #58 Posted by **Norm** on 28 July 2003, 8:14 p.m.,*
in response to message #57 by Gene

Gene wrote:

> Actually, shareholder value IS the appropriate goal
> for a company. After all, the company belongs to
> shareholders and management is their agent.

> However, the problem results when management and/or
> shareholders focus on the short-term instead of the
> long-term.

I think this sounds like Swahili. It does not make sense, except in the narrow viewpoints of the super-rich class of business owners who don't care about anybody or anything. It is a selfish focus purely upon who owns the company.

I know what will happen now, comes a thought of socialism vs. capitalism. Now, I am no commie, Gene, I am a graduate of Rush Limbaugh or Mike Savage or both, take your pick, I breathe red white and blue, I believe in freedom not taxation, etc etc. However how much money did we make when we flew Voyager past the planets?? How much did we make when we grabbed rocks off the surface of the mooon ????? How much money is made by visiting the bottom of the ocean or how much money does AGILENT make by offering a unique machined & polished test-fixture at $500 a pop that they only sell 10 units per year ??????

Did you know that the Boeing company was damn near bankrupted by creation of the 747 back somewhere in the 1970's, and that the management style you described would have never taken such a risk, hence we would never have had the cool-looking world's biggest aircraft with the hump-back and the double-decks and the spiral staircase ??? So who's got the better style, the management that plays everything safe and just concentrates on laying everybody off and selling buggy whips, or the management that pursues the new ideas in harmony with engineers, as a quest to get to cool and exciting new things ?

SO is it always about making money on a selfish basis? Or is it also about advancing technology itself, pursuing the new ideas, and providing the customer with what the CUSTOMER WANTS (which is invariably the new and superior innovative technology, not just the same old damn-fool buggy whips at Home Depot).

So! I do NOT think the ultimate goal of a company is to put the maximum amount of money in the bank. Instead, the ULTIMATE goal of a company is to do superior new things. That is to advance knowledge, methods, techniques, and intellectual property, and

THAT is what ultimately secures our place in this world, NOT just having the biggest pile of money by doing the most clever job of laying people off and knocking off your competitors, reducing quality and gettting rid of engineers (or their calculators) and discontinuing products and developments that cost the company money.

YOUR viewpoint would be perfect for the Acme Buggy-Whip company in 1895. Then along comes those stinkin' engineers with the horseless carriage ..... SO maybe your viewpoint needs an expansion towards considering the need to create the cool new things.

The engineering department creates those cool new things (IF it is staffed with competent engineers). You said it all goes wrong with short-term vs long-term focus.

I disagree. Know where it really all goes wrong ? It all goes wrong when there are too many phony engineers. They have macaroni and cheese for brains, but the same cut-throat heart that you are admiring in the MBA. They fake and they con, and their ideas and their stuff doesn't work, but they still waltz off with their pay, their contract, or whatever. I've met more than a few. The miserable new welfare-system "government grants" actually encourages scam engineering and is multiplying it up at a massive rate, like doubling that kind of fake-business (gov grant subsidized) every few years. Management has all the money so they make all the decisions, but they have no idea who are the competent engineers and who are the fake engineeers. THAT is where it all goes wrong. So then management stares blankly amongst different engineers who want to do different things, and lays off all of them.

What MBA's need to do, if they want to avoid the conflict, is learn something about engineering, so if an engineer says "I wish to reduce the weight of this assembly" or "I wish to increase the maximum speed at which this can operate" or "I wish to allow this to work at a higher temperature" that they could have enough engineering knowledge to have some faint glimmer of understanding whether the ideas are valid or not, and then know which engineers to let proceed with the engineering work.

I don't see that happening. I see, presently, MBA types who take immeasurable pride in not being able to change a light bulb, and when you pry for whatever philosophies they seem to be operating under, they just want to create maximum equity for their shareholders. I think life is a little more complicated than just seeing how much money you can hoarde, and as long as the MBA's show pure selfishness about money only, and

cannot differentiate between good engineering and bad engineering, then the festering rift between the two camps shall surely continue.

To avoid cluttering the chat board further, you are welcome to simply respond directly to my e-mail (click on blue link at the top). And if you got this far, BTW, I think the "mba nightmares" were very funny upon re-reading, so how could I cut you slack by not posting them. If I didn't post them just to please you, wouldn't that be denying freedom of speech and thought ?? I'm surprised nobody added to them .

:o)

Cheez, the real reason maybe it offends is that MBA's have NO post-college nightmares. I dont think an MBA even begins to understand the amount of study and dedication a REAL engineer has got to do (not a fake engineer). And a real engineer's work is much like trying to be Wolfgang Amadeus Mozart or Beethoven, etc., its a lifetime passion, and it was the same for, say designer of the 41C..... a lifetime passion..... to where the initial studies can create lifetime bad dreams, etc., and the MBA may have no appreciation of that, because all they have to do is wink and nod and deliver the secret handshake to their buddies (killing a few astronauts also is a plus) and the bank vaults are opened to them, so what's to worry.

Best,

- Norm

Sorry, you're wrong

*Message #59 Posted by **Gene** on 28 July 2003, 9:40 p.m.,*
in response to message #58 by Norm

Companies exist to make money for those who own them. Period. Businesses are either sole proprietorships, partnerships, or corporations. In each case, they are owned by owners who given their money to earn more money. Just as a mom and pop shop wouldn't earn money for long by selling spoiled beef sandwiches, neither would a corporation earn money for its owners for long by selling inferior products. Doesn't mean some mom and pop shops don't do that nor does it mean that corporations don't. They won't stay in BUSINESS for long, however.

I have attempted to be civil in this discourse, yet you persist in being antagonistic.

Sometimes ignorance is apparently bliss.

Gene,

*Message #60 Posted by **Norm** on 29 July 2003, 2:31 a.m.,*
in response to message #59 by Gene

Gene,

I'm doing my best to communicate with you directly, by direct e-mail, but you don't provide any email address to contact you directly.

I dont really want to clutter up the chat board in a debate with you, which is what you are starting to cause.

As for the simplistic comment "sorry you're wrong" well Gene, you aren't exactly dealing with this point by point.

So just how much money did we make by going to the moon and picking up a few rocks ? Did that fail, collectively speaking, to put the nation into 4000 sq ft houses with hot tubs out back? You bet it did. People lived very humbly in order to allow technical quests.

Your approach is just to make sure that management and the CEO and the shareholders all live in ostentatious houses with Barbeque's out back sized to feed 50 men (even though there's typically just 2 people living in that 4000 sq ft house of yours).

YOu haven't responded to my points, and you contort what I said entirely. You suggest that I promote the sale of inferior products.

For example, you suggest that I promote the sale of spoiled corned-beef sandwiches.

Gene, when you keep that up, you are just demonstrating how hopelessly out of touch you MBA types are. You can't even follow some fairly clear black & white viewpoint that I gave you, and you come up with the total inverse of what I said.

Although I had suggested you contact me directly, when I see the non-response to my careful input to you, then I now suggest we cease this debate, and you go back to counting your millions, discontinuing products, and laying people off, and I will return to the engineering of a technologically superior new item, which I work on privately, which should hopefully result in my 4th patent (after a total of several years of hard and sacrificial work).

Thank you for not keeping this up, it's clearly a total mismatch of thought processes, incompatible as oil and water, is the MBA and the engineer.

- Norm

Norm; 3 short things

*Message #61 Posted by **db(martinez,california)** on 29 July 2003, 11:01 p.m.,*
in response to message #60 by Norm

1) In your posts here, i agree with you about 95% of the time. If you keep ranting, i'll keep reading.

2) I don't think that Gene ever said he prefers the total outcome of the way things are, HP in particular. He just said that that is the way the economic/social system is.

3)Be careful with rush. Have you noticed he does the bait and switch a lot? He will tell the obvious truth 8 or 9 times out of ten and then when your defences are down he slips a big one through.

its the only thing I'm sure of

*Message #62 Posted by **Norm** on 30 July 2003, 1:08 a.m.,*
in response to message #61 by db(martinez,california)

Rush Limbaugh is like a cement foundation.....

when I am listening to Rush, its "dont bug me, this is the only thing I'm sure of".

How could Rush ever say anything incorrect ... hasn't happened yet

U gotta love the music though....they got some really comical musicians who make up songs.

:o)

And just for the record ...

*Message #63 Posted by **Valentin Albillo** on 25 July 2003, 4:45 a.m.,*
in response to message #47 by bill platt

And just for the record,

```
lim[ cos(cos(cos(...(cos(x)...))) ]
```

when the number of 'cos' tends to infinity, is also defined for all real x and converges to this value, which you can compute with your trusty HP-15C, a suitable multiprecision program, and just a little patience:

```
lim = 0.739085133215160641655312087673873404013411758900757464965680635773 2...
```

The convergence here is much quicker than in the case of the sine function. In both cases, if x is complex, neither limit does converge but you get an hiper-exponential explosion(i.e: exp(exp(exp(...)))), with clear signs of fractal behaviour in the slopes of the incredibly step peaks. It's quite a mathematical experience to plot those functions for complex x, as 3D graphs, using colour for the 4th dimension needed in addition to the normal three spatial dimensions. The resulting graphics are amazing indeed.

Best regards from V.

Edited: 25 July 2003, 4:46 a.m.

And just for the record ...VERY COOL! (no text)

*Message #64 Posted by **bill platt** on 25 July 2003, 8:57 a.m.,*
in response to message #63 by Valentin Albillo

!

Re: Limit of Sin(Sin(Sin(...)))

*Message #65 Posted by **David Smith** on 26 July 2003, 2:33 p.m.,*
in response to message #46 by Valentin Albillo

For small values of x, you can assume sin(x) equals x. This is a common appoximation taught in most trig and numerical analysis classes.

Re: 12c Platinum Perpetuity challenge

*Message #66 Posted by **Frank Wales** on 20 July 2003, 1:57 p.m.,*
in response to message #1 by tony

A few other data points: my 1988 14B solves this in about 2.5 seconds; my 2001 10BII solves it in about two seconds; and the 'MathU' RPN calculator for PalmOS solves it instantly.

And, as with everyone else, my 12CPt never returns from its journey through SlowlyThrobbingRunningLand.

(For the benefit of anyone who's tracking this, my 12CPt's serial number is: CN31600185.)

Re: 12c Platinum Perpetuity challenge

*Message #67 Posted by **tony** on 21 July 2003, 5:30 a.m.,*
in response to message #66 by Frank Wales

Thanks for the serial number Frank. I was beginning to think maybe I had the only 12CP that did this. It is hard to imagine how the 12CP fails to converge. In fact there are 6 values if i that make the 12CP give the same PV=100, namely: 10, 9.999999999, 9.999999998,..,& 9.999999995 This means the 12CP has plenty of options to stop on.

More amazing is to put FV=-100 (as well as n=360,PV=100,PMT=-10, PMTs@ END) Then the 12CP solves for i=10 in 4 seconds flat!! However even for this case the sensitvity of the PV is the same - there are still the same 6 possible answers for i, as above.

So, why it does one case and not the other is quite a mystery.

-Tony

Re: 12c Platinum Perpetuity challenge

*Message #68 Posted by **bill platt** on 21 July 2003, 11:50 a.m.,*
in response to message #1 by tony

My 32sii:

with the following in the equation editor:

P*100*(1-(1+I/100^-N)/I+F*(1+I/100)^-N+B

solve I: input : P = -10 N = 360 F = 0 B = 100

Solving for I takes place in 10 seconds, and produces I = 10 (which is of course 120% interest per annum).

However, the starting conditions make a huge difference. Let's say the last time I ran a TVM computation, I had solved for the payment on a 67000 mortgage at 5% for 30 years, with monthly payments, I= 5% per annum, then, without starting the first guess for I = 1, then the run will take about 20 seconds, and produce I = -199.1958970637

So the moral of the story----boundaries and initial guesses are important, too------and I do not know how the 12C or 12cp is set up, but could not some of this be going on?

I am gerally very distrtustful of the idea of using a calculator to "solve" an equation when the solution really counts. I like to see it "on paper" as it were, and let the machine do the arithmetic, but let me do the algebra thank-you-very-much. But then again I am distrustful because I am not well versed nor highly experienced in either computer science or mathematics--I use mathematics to solve problems, but 12 years out of college you have to work hard to stay fresh with topics that are not used every year!

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