♥MoHPC♠ *The Museum of HP Calculators*

HP Forum Archive 21

[Return to Index | Top of Index]

New variant for the Romberg Integration Method

Message #1 Posted by ***Namir*** *on 18 Apr 2012, 12:48 a.m.*

Hi All,

I just posted, on my web site, the following article for a new variant for the Romberg method. The article actually looks at several variants and selects the best one.

Enjoy!!

Namir

Edited: 18 Apr 2012, 12:49 a.m.

Re: New variant for the Romberg Integration Method

Message #2 Posted by ***Matt Agajanian*** *on 18 Apr 2012, 12:50 a.m.,*
in response to message #1 by Namir

Thanks. This should be intriguing

Re: New variant for the Romberg Integration Method

Message #3 Posted by ***Nick_S*** *on 18 Apr 2012, 5:17 a.m.,*
in response to message #1 by Namir

Using both the HP-15c and Wolfram Alpha I get values that differ from yours for these examples:

ln(x)/x integrate 1 to 100 = 10.60378

x in radians
sin(x) integrate 1e-10 to pi/4 = 0.2928932

Nick

Edited: 18 Apr 2012, 5:27 a.m.

Re: New variant for the Romberg Integration Method

Message #4 Posted by ***Namir*** *on 18 Apr 2012, 7:16 a.m.,*
in response to message #3 by Nick_S

Nick,

Thanks for the corrections. I n the case of the sin(x), I meant sin(x)/x. I posted the article with the corrected results.

Namir

Edited: 18 Apr 2012, 7:29 a.m. after one or more responses were posted

Re: New variant for the Romberg Integration Method

Message #5 Posted by ***Valentin Albillo*** *on 18 Apr 2012, 7:24 a.m.,*
in response to message #4 by Namir

> Quote:
>
> ---
>
> Nick,
>
> Thanks for the corrections. I n the case of the sin(x), I meant sin(x)/x. I should posted a corrected article very shortly.
>
> Namir
>
> ---

The standard name for the sin(x)/x function is **sinc(x)**, an abbreviation of *sinus cardinalis* (i.e.: cardinal sine).

Regards from V.

Re: New variant for the Romberg Integration Method

Message #6 Posted by ***Namir*** *on 18 Apr 2012, 7:31 a.m.,*
in response to message #5 by Valentin Albillo

Right you are! And I learned a new function name. Alpha Worlfram recognized the sinc(x) funcion!!

:=)

Re: New variant for the Romberg Integration Method

*Message #7 Posted by **Paul Dale** on 18 Apr 2012, 7:39 a.m.,*
in response to message #6 by Namir

So does the 34S :-)

- Pauli

Re: New variant for the Romberg Integration Method

*Message #8 Posted by **Valentin Albillo** on 18 Apr 2012, 9:45 a.m.,*
in response to message #6 by Namir

> Quote:
>
> ---
>
> Right you are! And I learned a new function name. Alpha Worlfram recognized the sinc(x) funcion!!
>
> :=)
>
> ---

I'm glad you did, I also learn new things each and every day.

About the **sinc(x)** function, it has many interesting properties and quirks but the one I find most uncanny is this: a little computation or theoretical work will quickly stablish the following results:

- I_1 = Integral(0, Infinity, sinc(x) dx) = **Pi/2**
- I_2 = Integral(0, Infinity, sinc(x)*sinc(x/3) dx) = **Pi/2**
- I_3 = Integral(0, Infinity, sinc(x)*sinc(x/3)*sinc(x/5) dx) = **Pi/2**
- I_4 = Integral(0, Infinity, sinc(x)*sinc(x/3)*sinc(x/5)*sinc(x/7) dx) = **Pi/2**

- I_5 = Integral(0, Infinity, sinc(x)*sinc(x/3)*sinc(x/5)*sinc(x/7)*sinc(x/9) = **Pi/2**
- I_6 = Integral(0, Infinity, sinc(x)*sinc(x/3)*sinc(x/5)*sinc(x/7)*sinc(x/9)*sinc(x/11) = **Pi/2**
- I_7 = Integral(0, Infinity, sinc(x)*sinc(x/3)*sinc(x/5)*sinc(x/7)*sinc(x/9)*sinc(x/11)*sinc(x/13) = **Pi/2**

but lo and behold, we unexpectedly find that

- I_8 = Integral(0, Infinity, sinc(x)*sinc(x/3)*sinc(x/5)*sinc(x/7)*sinc(x/9)*sinc(x/11)*sinc(x/13)*sinc(x/15) = **Pi/2.0000000000294+** !!

You might want to check this amazing fact by trying and computing said integrals I1, I2, ..., I8 using the 34S' extreme precision capabilities, it would be a fine test for any numerical integration procedure such as yours ! ... XD

Best regards from V.

Re: New variant for the Romberg Integration Method

*Message #9 Posted by **Nick_S** on 18 Apr 2012, 7:47 a.m.,*
in response to message #5 by Valentin Albillo

This brings back memories as the sinc function was one of the first things I plotted as a teenager on my newly acquired Sinclair ZX81 computer.

Nick

[Return to Index | Top of Index]

GTO Go back to the main exhibit hall