Subject: Re: ProductLog function
Posted by Vince Hradil on Thu, 01 May 2008 13:35:13 GMT
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On May 1, 6:32 am, emitch...@googlemail.com wrote:
> Hi all, I've used Wolfrang Mathmatica to solve an equation for x, and
> have been given a solution involving the function ProductLog. I was
> wondering if anyone knew if there was any inbuilt capacity in IDL to
> evaluate this. It's definitely different to PRODUCT(ALOG(x)), as I've
> tried this but results were wrong.
>
> I'm trying to convert a matrix of y's to x's, but the equation I need
> to use is:
>
> y = 0.0015x + a(1-exp(-bx))
>
> Mathmatica gave me (to 6sf):
>
> 0.333333(-2000.a + 2000.y +
> (3.ProductLog(666.667(a.b.exp(666.667b(1.a-1.y)))))/b
>
> I tried this in IDL, but no joy:
>
> (1D/3D)*(-2000D*a + 2000D*y + (3*(PRODUCT(ALOG((2000D/
> 3D)*a*b*exp((2000D/3D)*b*((a-1D)*(y)))))/b))
>
> Cheers,
>
> Ed

A quick search of the 'net yielded: http://en.wikipedia.org/wiki/Lambert%27s_W_function

Unfortunately, a quick search of IDL help yielded only Lambert wrt map projections. However, the wiki page above has an evaluation algorithm.

BTW - I used Maxima to get:

$$[x = -\frac{\%e^{-b\,x}\,(\%e^{b\,x}\,(a - y) - a)}{c}]$$

Which you could solver iteratively...

Good luck!