
Subject: Re: ProductLog function

Posted by [Allan Whiteford](#) on Thu, 01 May 2008 13:36:02 GMT

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emitchard@gmail.com wrote:

> Hi all, I've used Wolfram Mathematica 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:

>

> $y = 0.0015x + a(1 - \exp(-bx))$

>

> Mathematica gave me (to 6sf):

>

> $0.333333(-2000.a + 2000.y +$
> $(3.\text{ProductLog}(666.667(a.b.\exp(666.667b(1.a-1.y)))))/b$

>

> I tried this in IDL, but no joy:

>

> $(1D/3D)*(-2000D*a + 2000D*y + (3*(\text{PRODUCT}(\text{ALOG}((2000D/$
> $3D)*a*b*\exp((2000D/3D)*b*((a-1D)*(y))))))/b))$

>

> Cheers,

>

> Ed

>

>

Ed,

I think you're looking for an implementation of the Lambert W function.
IDL doesn't have one inbuilt. You can probably find a Fortran or C
implementation and convert or use it;

<http://www.netlib.org/toms/443>

seems to do it.

Thanks,

Allan
