

# Re: Upper bounding a transcendental function with Polynomials.

**Source:** <http://sci.tech-archive.net/Archive/sci.math.symbolic/2004-08/0128.html>

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**Date:** 08/16/04

Date: 16 Aug 2004 04:48:33 -0700

"Jan C. Hoffmann" <jch@arcore.de> wrote in message  
news:<411f924f\$0\$7318\$9b4e6d93@newsread2.arcor-online.net>...  
> "Jan C. Hoffmann" <jch@arcore.de> schrieb im Newsbeitrag  
> news:411de411\$0\$7311\$9b4e6d93@newsread2.arcor-online.net...  
>>  
>> <blah12@mail.com> schrieb im Newsbeitrag  
>> news:75ec2d78.0408131702.6e4dd207@posting.google.com...  
>>> "Jan C. Hoffmann" <jch@arcore.de> wrote in message  
> news:<411c62ae\$0\$7312\$9b4e6d93@newsread2.arcor-online.net>...  
>>>> <blah12@mail.com> schrieb im Newsbeitrag  
>>>> news:75ec2d78.0408111757.2dbcbe7d@posting.google.com...  
>>>>> Hello everyone,  
>>>>>  
>>>>> I am trying to solve the following problem :  
>>>>>  
>>>>> I have a function  $f[x]$  given as an unsolvable integral  
>>>>> which is :  
>>>>>  
>>>>>  $f[x] = - \text{Integrate}[\text{Exp}[-y^2/2]/\text{Sqrt}[2*\text{Pi}] * \text{Ln}[(1-B) + B/D * \text{Exp}[(y+A*x)^2/2/(1+C)]] , \{y, -\text{Infinity}, \text{Infinity}\}]$   
>>>>>  
>>>>> where  $A > 0$  ,  $0 < B < 1$  ,  $C = 1/A^2$  ,  $D = \text{Sqrt}[1+A^2]$   
>>>>>  
>>>>> now define  $g[x] = f[x] - f[0]$ .  
>>>>>  
>>>>> It is easy to see that  $f[x]$  and  $g[x]$  are even functions of  $x$ .  
>>>>> Also  $g[x=0] = 0$  , and it can be seen that  $g[x] < 0$  for all  
>>>>> other  $x$  (  $g'[x] < 0$  for all  $x > 0$ ) and finally  
>>>>>  $\lim_{x \rightarrow \text{Infinity}} (g[x]) \rightarrow -\text{Infinity}$   
>>>>>