Spring 2011 Welcome

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Classic Origin of Good and Evil

Euler Sums a Divergent Series

$$\sum_{n=0}^{\infty}(-1)^n n! = 0.59637255\ldots$$

Abel

Divergent series are in general the the work of the devil and it is shameful to base any demostration whatever on them

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How Some Advisors View the Math Department

Advisors (other than Esther) are not your friend

- Do not reply to email from students wanting to add your class just forward them to advisor@math.fsu.edu

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The Evils of Student Email

- You don’t have to answer email.
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Disney Again, You need a Crystal Ball

Accommodations

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$$f(x) = \sum_{n=0}^{\infty} (-1)^n n! x^n = 1 - 1!x + 2!x^2 + \cdots$$

$$g(x) = xf(x) = \sum_{n=0}^{\infty} (-1)^n n! x^{n+1} = x - 1!x^2 + 2!x^3 + \cdots$$

$$g'(x) = \sum_{n=0}^{\infty} (-1)^n (n+1)! x^n = 1! - 2!x + 3!x^2 + \cdots$$

$$x^2 g'(x) = \sum_{n=0}^{\infty} (-1)^n (n+1)! x^{n+2} = 1!x^2 - 2!x^3 + 3!x^4 + \cdots$$

$$x^2 g'(x) + g(x) = x$$

Solve the ODE

$$g' + (1/x^2)g = 1/x$$

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$$g' + (1/x^2)g = 1/x$$

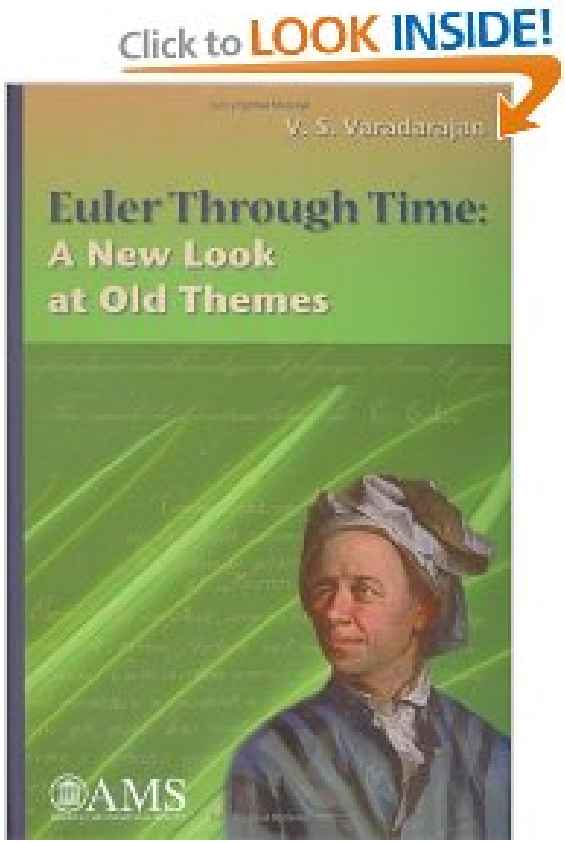
$$(g(x)\exp(-1/x))' = exp(-1/x)/x$$

$$g(x)\exp(-1/x) = C + \int exp(-1/x)/x\, dx \quad \text{eventually} C = 0$$

$$g(x) = \exp(1/x)\int_0^x exp(-1/x)/x\, dx$$

and Euler numerically computed the integral for $x = 1$

A reference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