Subject: Re: plot dirac delta function?
Posted by James Kuyper on Sun, 30 Jul 2006 14:18:20 GMT
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swingnut@gmail.com wrote:
> Ah, I see we're about to head off into the realm of defining functions,
> ever a popular discussion (not the least of which is because I relish
> the opportunity to learn more about it, not being a mathematician). Why
> do you say this? In plasma kinetic theory a while back, the prof give
> us the pop quiz about the value of particle distributions made from
> sums of delta functions. As with the "How do you put an elephant into
> the refrigerator?" test, everyone jumped to the wrong answer since the
> integral of the Dirac delta is 1. The function wasn't a sum of
> integrals, its a sum of deltas, so the value of the distribution at a
> particle's parameters in the phase space we were working in is
> infinity.

That's just a test question about a intrinsically meaningless intermediate step in a calculation. The only thing you can ever meaningfully do with such a particle distribution function is integrate over it, one way or another. The value of such a function at a given point is meaningless, except in those places where it's zero, in which case it's meaningful only as a simplified approximation to reality. It's value at any point where it's non-zero is not a measurable quantity. Can you show me any actual calculations where the value of a dirac delta function at 0 is actually used to calculate something meaningful, without being integrated over?