

Re: One-dimensional heat equation

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In article <7156fcf8.0410250702.4537571d@posting.google.com>,

Ken Honda <Honda_Kiai@hotmail.com> wrote:

>Oh my, how embarassing! This is what I get for posting late at night

>on very little sleep. I transcribe the problem incorrectly, and

>thankyou very much to all for pointing this out!

>We start with the heat equation

>

> $dU/dt = d^2U/dx^2$

>

>on a finite interval $(0,L)$ with the following conditions:

>

> $U(t,0) = U(t,L) = 0$

> $U(0,x) = U(x)$

>

>and furthermore $f(x)$ admits a representation

>

> $f(x) = \sum\{A_n \sin(n\pi x/L)\}$ for $n > 0$

>

>and we want to know if the integral of $u(t,x)$ with respect to x from

>–infinity to positive infinity changes over time. (I think that the

>above is a typo and that we are only supposed to evaluate the integral

>of $u(t,x)$ with respect to x from 0 to L). The next part of the

>question reads "What is the behavior of this integral as t approaches

>infinity? Give a physical explanation; think of a finite heated wire,

>both of whose ends are embedded in an ice cube at constant temperature

>0."

>

>Sorry for the confusion, and thanks very much for all of your replies.

>I don't understand how admitting this representation for $f(x)$ allows

>one to show that the heat of the system converges; is this really dumb

>of me? Is it something obvious that I've missed?

First let's clarify: what is $f(x)$ and what does it have to do with this problem?

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Rouben Rostamian