

# Re: A set containing a nonempty open interval

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*Source:* <http://sci.tech--archive.net/Archive/sci.math/2005-08/msg05178.html>

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- *From:* A N Niel <[anniel@xxxxxxxxxxxxxxxxxxxxxxxx](mailto:anniel@xxxxxxxxxxxxxxxxxxxxxxxx)>
  - *Date:* Fri, 26 Aug 2005 14:28:57 -0400
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In article <denmfc\$o5k\$1@xxxxxxxxxxxxxxxxxxxxxxxx>, Keith A. Lewis <[klewis@xxxxxxxxxxxxxxxxxxxxxxxx](mailto:klewis@xxxxxxxxxxxxxxxxxxxxxxxx)> wrote:

> "Amanda" <[sca18@xxxxxxxxxxxx](mailto:sca18@xxxxxxxxxxxx)> writes in article  
> <1125067955.450481.88600@xx> dated 26 Aug 2005  
> 07:52:35 -0700:  
>>  
>> I'd like some hints on how to prove that, if a set S has positive  
>> Lebesgue measure, then  $(A + A)/2 = \{(x + y)/2 \mid x \text{ and } y \text{ are in } A\}$   
>> contains a non-empty open interval.  
>  
> Unless you specify  $x \triangleleft y$ , you might get all closed intervals.

By "contains a non-empty open interval" he means it has a subset which is a non-empty open interval.

>  
> For example,  
>  $A = [0,1] \cup [10,11]$   
> gives  
>  $(A+A)/2 = [0,1] \cup [5,6] \cup [10,11]$   
> which contains no open intervals.

This contains the open interval (0,1) for example

>  
> But if you stipulate  $x \triangleleft y$  you get  
>  $(A+A)/2 = (0,1) \cup [5,6] \cup (10,11)$   
> which does contain open intervals.  
>  
> U is the union operator.  
>  
> --Keith Lewis [klewis@mitre.org](mailto:klewis@mitre.org)  
> The above may not (yet) represent the opinions of my employer.  
>

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- *Follow-Ups:*

Re: A set containing a nonempty open interval

◆ **Re: A set containing a nonempty open interval**

◇ From: Keith A. Lewis

• **References:**

◆ **A set containing a nonempty open interval**

◇ From: Amanda

◆ **Re: A set containing a nonempty open interval**

◇ From: Keith A. Lewis

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