Re: Normal families, complex analysis question

Source: http://sci.tech−archive.net/Archive/sci.math/2005−12/msg04148.html

- *From*: "James" <James545@xxxxxxxxx>
- *Date*: Thu, 22 Dec 2005 11:11:41 −0500

"David C. Ullrich" <ullrich@xxxxxxxxxxxxxxxx> wrote in message
news:ahilq1phdftgt4s1n1cbebtfq3dn0hhorv@xxxxxxxxxx
> On Thu, 22 Dec 2005 10:20:16 −0500, "James" <James545@xxxxxxxxx>
> wrote:
>
>>Let H be the family of functions h analytic on D = { | z | < 1 } so that
>>
>>h(D) is contained in C − [−oo,0].
>>
>>I am trying to show that H is a normal family.
>>
>>So the image of h is contained in a domain that can be used as a branch of
>>log. The function
>>
>>f (z) = [sqrt(z) − 1] / [sqrt(z) + 1]
>>
>>maps C − [−oo,0] analytically isomorphically to D.
>>
>>So I have that | f o h | <= 1
>>
>>for all h in H. I want to show that H is locally bounded.
>>
>>But that is all I can get, and it doesn't help me at all. Any thoughts?
>
> You actually have that | f o h | < 1 in D, and this shows
> that if K is a compact subset of D then there exists c < 1
> such that | f o h | <= c in K.

Yes

> That shows that h|K takes
> values in some compact subset of C − [−oo,0].
>

Yes, but that is only for this h. c depends on h, and the c could get
arbitrarily close to 1. I agree that for a particular h, there is a c like
you said, and h | K is bounded. But how do you say this uniformly for all h
in H?

>>James
>>
>
>
> **********
>
> David C. Ullrich

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- ***Follow−Ups***:
  - ♦ ***Re: Normal families, complex analysis question***
    - ◊ *From:* David C . Ullrich

- ***References***:
  - ♦ ***Normal families, complex analysis question***
    - ◊ *From:* James
  - ♦ ***Re: Normal families, complex analysis question***
    - ◊ *From:* David C . Ullrich

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