

Re: Internal Bisectors of a Triangle

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- *From:* Maury Barbato <mauriziobarbato@xxxxxxxx>
 - *Date:* Wed, 07 Jun 2006 13:09:29 EDT
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matt271829-news@xxxxxxxxxxxx wrote:

Maury Barbato wrote:

Hello,
the Italian Mathematician O. Chisini proved in his
work "Sulla costruzione di un triangolo date le

tre

bisettrici, *Periodico di Mat.*, (4), 1, 1921, 43-51

and

108-121" that the construction of a triangle, given

its three internal bisectors, can't be made only with
ruler

and compass.

By "internal bisectors" do you mean the perpendicular
bisectors of the
triangle's sides? If so, I'm a little surprised that
you can't
construct a triangle having given bisectors using
ruler and compass. It
looks to me like you can do the calculations with no
more than
addition, subtraction, multiplication and division of
lengths, which
should mean you can do it with ruler and compass, no?

Surely this construction should be possible. But I don't
know your reasons: what calculations do you refer?

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I don't think you can mean the angle bisectors either, as a ruler-and-compass construction is possible in that case (by coincidence, see http://groups.google.com/group/alt.math.undergrad/browse_frm/thread/9634317e4e965288).

Maybe I have made a mistake, or maybe you mean something else.

Sorry, I have made a howler. In the problem studied by Chisini is totally different: to construct a triangle give the lengths of its three angle bisectors. I think the existence is not ensured, but maybe the uniqueness is. What do you think about?

I have now two more elementary questions:
(I) given three distinct straight lines concurrent

in a

point I , is there a triangle having these lines as internal bisectors?

(II) if such a triangle exists, is it essentially

unique

(that is every other triangle which solves the

problem

can be obtained by the first by a homothety with

center

O)?

Thank you very much for your help.

Maury

Many other problems like that studied by Chisini can be put. E.g., one can assign the lengths of the three

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perpendicular bisectors (the segments which join the circumcenter to the midpoints of each side). Do you know a bibliography about them?

Thank you very much for your help.
Maury

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