Re: Triangles Inscribed in a Circle

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- *From*: "The Qurqirish Dragon" <qurqirishd@xxxxxxx>
- *Date*: 5 Sep 2006 07:58:50 −0700

Thomas Mautsch wrote:

> Maury Barbato wrote:
>
> > consider an isosceles triangle ABC, with AC=BC, inscribed in a circle C. Then move the vertex A (or B) on the circle to obtain A'C=A'B (respectively B'A= B'C). The new triangle A'BC

(or AB'C, but these two triangles are

equal) has a greater area and and a longer perimeter than

ABC. Now you can repeat the procedure, moving B or C (respectively A or C), to obtain a new isosceles triangle, and so on. The sequence of inscribed triangles has increasing area and perimeter, and I think it converges to an equilateral triangle inscribed in the circle. What do you think?

This result would allow to give a pure geometric proof of the well−known fact that the equilateral triangle is the triangle of maximum area and perimeter among all the triangle inscribed in a

given
circle.

In news:<1156857484.474839.6880@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>
schrieb "The Qurqirish Dragon" <qurqirishd@xxxxxxx>:

> My previous post, which asserted the conclusion actually
> proved that the equilateral triangle has the maximum area.

No. You only showed
that to every inscribed triangle that is not equilateral,
there exists an inscribed triangle with larger area.
But you did not mention that one also has to assert
that there *is* an inscribed triangle
for which the area takes on a maximum value.

Otherwise, you could apply your style of "proof"
to show that 0 is the maximum number in the half−open interval [0,1):

For every value x in (0,1), the number x*(2−x) also lies in (0,1),
and is larger than x itself − so it can't be the maximal value;
on the other hand for the value x = 0, x*(2−x) stays at 0.

Would you conclude that 0 will be the maximum in the interval [0,1)?

No, since your proof only considers the open interval. Nowhere did you state anything about 0 itself. My triangle statement, now that you use this example so I can see the flaw, does miss the degenerate case where all 3 vertices of the original triangle are the same point. The area of this triangle can only be increased by moving 2 points. For any other case, my proof works. (any non−equilateral triangle can have its area increased by moving a vertex not on the perpendicular bisector of the opposite side to such a point. There are two such points, but my algorithm chooses the one such that the center of the circle lies inside the triangle.)

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