Re: polygons circumscribing a circle

Source: http://sci.tech−archive.net/Archive/sci.math/2007−07/msg02628.html

- *From*: Michael Press <rubrum@xxxxxxxxxxx>

- *Date*: Tue, 17 Jul 2007 05:56:44 GMT

In article
<1184610934.877197.106720@xxxxxxxxxxxxxxxxxxxxxxxxxxxxx>
,
Musing <generalizing@xxxxxxxxxxx> wrote:

> How does one show that the perimeter of a regular polygon
> circumscribing a circle is greater than the circumference (of the
> circle)? Thanks.

You ask a very good question. There is no easy answer.
Defining arc length for curves is technical. To a
small degree it is a matter of faith that we get the
definition right.

For the circle we prove that the perimeter of an
inscribed polygon is smaller than the perimter of a
circumscribe polygon. We can prove that as the number
of sides of the polygons increases the perimeter
of the circumscribed polygons get smaller; and the
perimters of the inscribed polygons get larger; and the
they both approach a limit; and that the limits are
equal. We define the length of the circle to be that
limit. So obviously the length of the circumference of
the circle is less than the perimeter of any
circumsribed polygon. This is known as a circular
argument. :)

We can define arc length of a curve if the curve has a
tangent at each point. Have you studied calculus? Arc
length is defined by way of derivatives there.

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Michael Press
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