Re: Cantor Confusion

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- *From*: "Dik T. Winter" <Dik.Winter@xxxxxx>
- *Date*: Sat, 25 Nov 2006 03:12:20 GMT

In article <lcbem29apkc14rfr1m1jtqaqj2anh1e41l@xxxxxxx> Lester Zick <dontbother@xxxxxxxxxxx> writes:

> On Fri, 24 Nov 2006 01:10:39 GMT, "Dik T. Winter" <Dik.Winter@xxxxxx> wrote:

....

>> Pray, tell me. I would say that a straight line in the Euclidean plane is a line of the form $ax + by = c$. With the standard formulas for angles it is easy enough to get rectangles. And I would say that a rectangle is a square when the sides have equal length (this is the point where the measure creeps in). So we have a rectangle enclosed by the lines:
>> $x + y = 1$
>> $x - y = 1$
>> $- x + y = 1$
>> $- x - y = 1$
>> Now define the Manhattan measure:
>> $d((x1,y1), (x2,y2)) = ||x1 - x2| + |y1 - y2||$
>> and we see easily enough that the figure enclosed by the lines above is a square with sides with length 2.
>>
>> A circle is a figure where each point has the same distance to a common centre, and it is also easy to show that the points on the boundary of that square have the same distance to the origin: 0.

> Well for one thing points equidistant from any point define a sphere not a circle unless one assumes "on a plane" when the Euclidean plane isn't defined to begin with. But my question was directed not at the definition of a circle or square on a Euclidean plane but at the definition of a square with the Manhattan measure.

You completely misunderstand what I wrote. I *start* with an Euclidean plane without measure (i.e. distance function). With that we can at most define a rectangle. Neither a square, nor a circle.

> In other words we have two different figures defined in the Euclidean metric, one as a curve and one with straight lines. Now I'm not trying to quibble over the modern math definition of either figure at the moment, just trying to point out that you have certain characteristics and properties defined in the Euclidean metric and then apparently claim that if you use some other metric and don't use the Euclidean metric the two figures are the same.

I do not use Euclidean metric at all. Where, above, do I use Euclidean metric?

> For example is it possible to define plane squares with non Euclidean metrics?

Of course.

> And can we define right angles without the parallel postulate
> people simply ellide when operating with non Euclidean geometries? No.

I think you can. But I used Euclidean geometry above.

> When I
> ask a question such as "why are square circles unimaginable" the defining metric for "squares" and "circles" is Euclidean and not Manhattan and I don't expect answers that if we look at Euclidean figures through some other metric we'll find they are imaginable.

In that case you should use better formulations in your questions. And when I follow−up to point out that in the Manhattan measure all circles are squares (but not the other way around) you should state that your formulation was insufficient.

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