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NEXT SHORTEST LINE

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In October 0f 2005 there occurred to me that (a Revelation?) that then resulted in the following.

There has been long taught for thousands of years and believed and to date unquestioned, by one and all the following axiom: The shortest connecting *distance* between two points is a straight line. This is mathematically and semantically incorrect. It is also specific (assumed only for a two-dimensional plane surface) and not generic.

The correct question is: Excluding all other surfaces, what is the shortest length that can connect two separated points (the distance between) on a two dimensional plane or in space (three dimensions)? The axiom is: The shortest connecting **length** between two separated points (a distance) on a two dimensional plane or in space (three dimensions) is a straight line.

#A: So then: (1) What is the length of the **next** line longer than the shortest straight line that is the shortest of all of the other lines, when said points are in space or on a two-dimensional plane, that can connect the two points? That is, the optimum geometrical configuration, not some loop, zigzag or whatever, connecting length. (2) The shorter (minimum optimum) longest?

#B:
#1: What is the shortest (closest) distance that the two points can be apart in order to have this connecting line?
#2: What happens when the point ends of the lengths of said two connected points are then pushed together (or can they?) AFTER they are connected?

This creates a conflict as there are an infinite number of points in distance so that there are always some infinite points between the two points being pushed together. One of Zeno's Paradoxes.

As to #B#1:

Subject to argument, the shortest *distance* between two points can be a single point. The proofs will follow.

DISCUSSION #A (1):

Assuming there are two separated points. The next shorter connecting length that is not a straight line will be two opposing arcs for a plane.

When the arcs is in three dimensions it has a surface area that is an oblate spheroid like a football shape.

For brevity, the two-dimensional results in following should be obvious.

Now for #B2:

Start pushing one or both of the points towards one another. How far can they be pushed together such that the point disappears OR it cannot disappear so that the shape remains?

DISCUSSION #A (2):

Now what is the optimum connecting distance? That will be a circle whose radius is one half the distance the points are apart. The circle's diameter is those two original points now connected, the straight line. Then its surface is a sphere for all of the possible connections.

What happens when the starting two points are pushed closer and closer? The sphere just keeps on becoming smaller and smaller as the starting point's distances are made closer and closer. So, how small can this sphere be?

As to #B2: Does the sphere disappear or not?

DISCUSSION #A (1) Continued:

The answer to this is a circle that the two points are lie apart on its circumference. Again, in 3-dimensions, it becomes a quasi-torus. Geometrical name unknown to myself. Cross-section is two overlapping circles that have a common chord

As to #B2: There is no problem here. When the points are pushed together afterwards (if possible) or the distance is *a single point apart to start*, the resulting figure is a torus that has no hole as each circumferencial circle (cross-section) composing it all touch at that one single point. Therefore, the shortest (closest) distance distance is a single point. There is nothing in the axiom that says or implies as to the distance per se or that the connecting length [line(s)] must be straight. Wrong assumptions (distance was greater than a single point, hence points (plural), for thousands of years.

But, this holeless torus can be then expanded afterwards so that it has a hole. When pushed inwards, it is the common chord previous one. So this might be one possible answer as the chord becomes shorter as the pull apart occurs, an exception to Zeno"s Paradox. The push in of the chord itself problem is still open.

Simply, with the next point push after touching, then the two point chord comes into existence. AND, the next one point push creates the **three point arc** on the circles.

There is a partial proof, or the one exception to show that the closest distance is a single point. BUT, is it legitimate for the connecting circle to be at right angles to that single point or a line "perpendicular" to that point on that one circle? All the circles for the torus are at a tangent to the original lines.

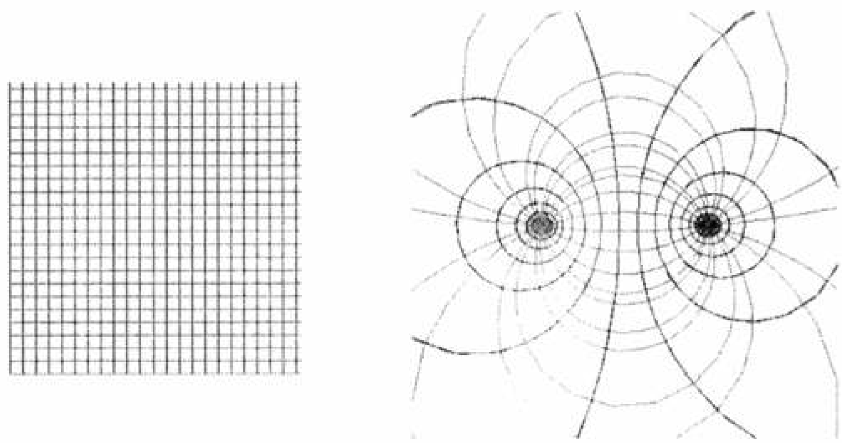
At the sake of overkill, it is simply, draw two separated circles the same size some length apart, i.e., that vertical cross-section of the torus Now push one towards the other until they first touch or that **one point**.

Then push further in so that they overlap and have a common chord. If spheres, a common disk that the chord is its diameter. Then with the last final push, **one point**, they merge together into one circle.

The same with other two-dimensional figures, three-dimensional solids, and one against the other when pushed together is not for here. This particular operation was named merging by the author and is covered in his works.

Though this discussion might appear as so much nonsense it is not so. It shows the further flawed mathematics as the mathematicians cannot prove the resulting obvious results and that upsets their infallibility. There is the usual physical application that proves that Mother Nature always knows best.

The following figure shows the equipotential lines between to different point charges.



Gauss recognized that the doubly extended nature of complex numbers allowed them to be represented, in their entirety, on any surface. Any transformation of the relative positions of these numbers, therefore, as in the case of applying a mathematical transformation, corresponded to a transformation of the least action lines of one surface to those of another. Here the complex sine function.

It is easily seen that (there should be a line here that is missing) the line connecting the two charges that is the straight line. Then notice the line that is the circle whose diameter (or close thereto) that is between the two points. Then notice the line that is the outermost circle whose arc connects the two points. The latter is the answer to the first question. It is a circle whose diameter approaches infinity and two points on said circle (the **shortest** arc) is the end result. The circle across the points is the answer to the second question.

However, the final result is that: a circle is the optimum connecting length line and the arc of a circle line is the next shortest connecting length that is not a straight line. This, of course, is **only** in point and pi mathematics and geometry.

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