Θ Paradox

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This paper engages with proving the existence of a theoretical paradox that is based on some concepts in math.

Check out https://www.github.com/ShimronAlakkal for more updates on this paper.

Introduction:

This experiment shows us a theoretical paradox of the relationship between an angle, **θ**, made by a stretched line from two stationary points on a straight line, from time t = 0s to t = ts. (refer to figure 1)

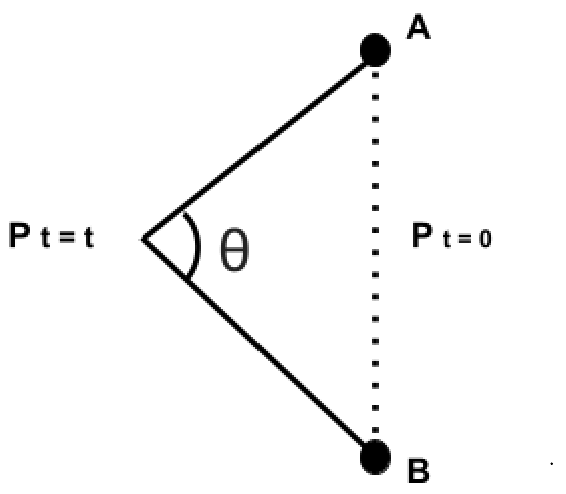


Figure 1

INTRO

Part 1 :

Assume that ‘**A**’ and ‘**B**’ are two stationary points on a single plane, separated by a constant distance ‘**x**’ such that ‘**x**’ ≠ **0 and** $0 < x \leq \infty$ (only considering 2D now), which are joined by a line (or a string for more practical reasons) ‘**AB**’ -- which is an infinitely stretchable line or string.

At a time t = 0s -- which is the initial time -- the angle **θ** between the points is 180 degrees (**π rad**).

At a time t = ts , i.e. when the line is stretched from a specific point (point of stretching), even for a tiny distance say **dY,** the angle is made between the points ‘**A**’ and ‘**B**’, opposite to the direction of stretch of line is always < 180 degrees (< **π rad**). A perpendicular distance, say ‘**y**’ is considered from the point of stretching to the final destination at time t = ts.

(refer to figure 2.1 and 2.2)

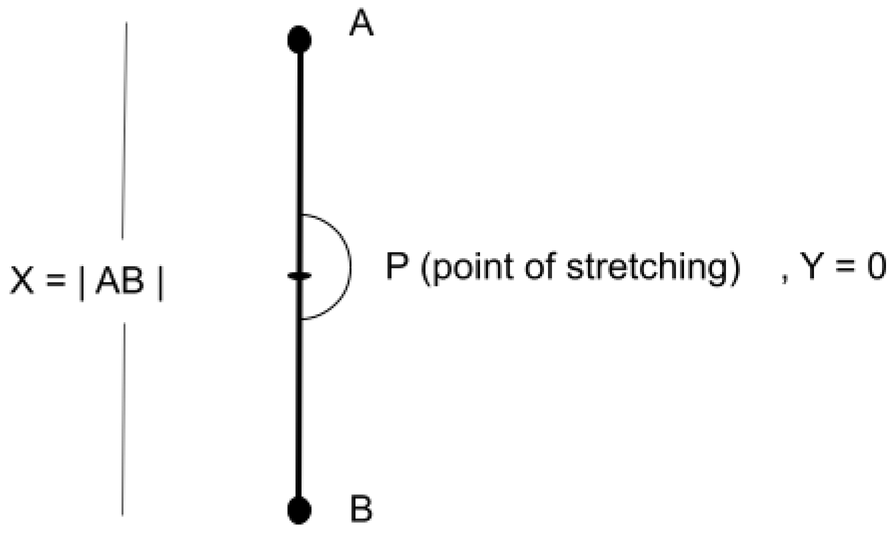


Figure 2.1, Initial state of line or string

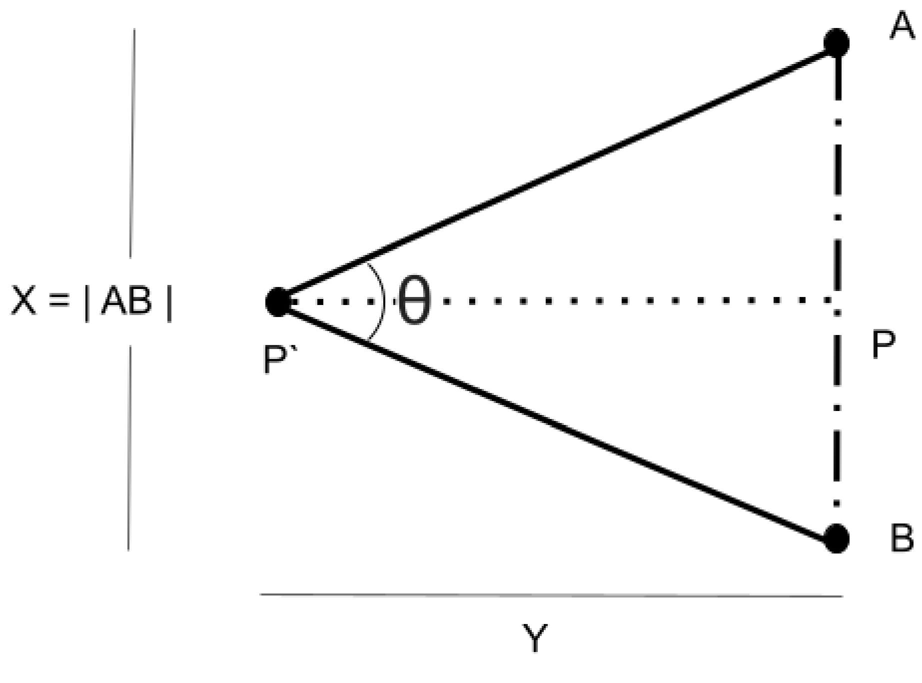


Figure 2.2, final state at a time t = t, θ<180

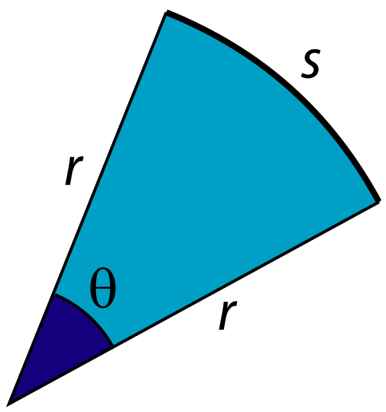
As long as **y** is stretched, the angle θ is always < 180 degrees.
The graph of the relation between angle as a function of distance from **P to the line joining A and B** goes similar to that of f(x) = 1/log(x).

From figure 2.2, we get ***(eq 1)***:

$$\theta \approx AB / P`B = AB / P`A = x / P`B$$

… similar to the applications in Physics used to calculate the arc second etc.

It is known that central angle in a circle subtended by an arc length (in radian) = Arc length / radius



$$\theta = s / r$$

When a circle has an infinite radius, a tangent to a point on the circle would be parallel to the circle, passing through the circle itself. Therefore, **<u>A CIRCLE WITH AN INFINITE RADIUS IS A STRAIGHT LINE.</u>**

When the line (a stretchable line between points A and B taken above) is stretched so that the magnitude of the perpendicular vector distance between the initial point of stretching and the final point is infinite, the angle **AP’B** is theoretically 0**°**. (refer to figure 3)

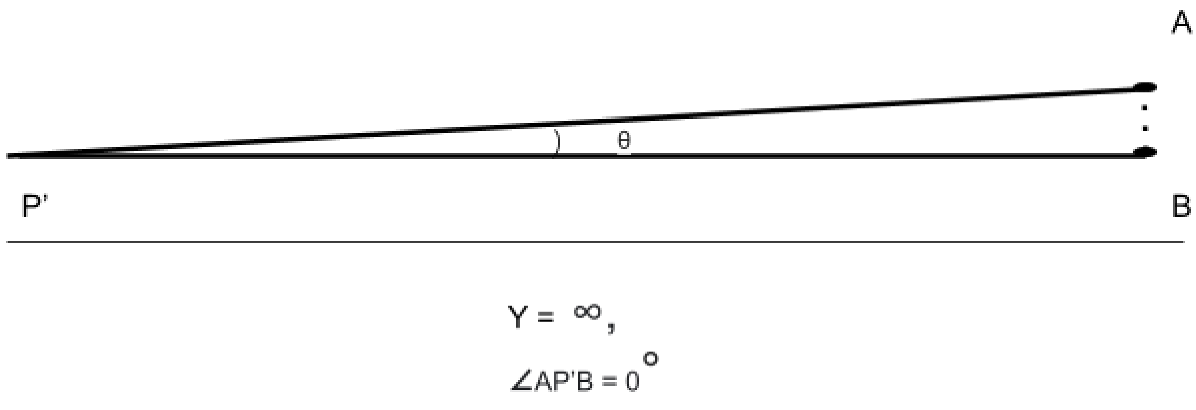


Figure 3

The above picture shows **P’** extended from a point **P, which is the midpoint of AB (taken for ease of solving).**
The above image is also scaled to pictorially represent an infinite distance. The magnitude of AB is still X units and will always be throughout.

Math:

From figure 3, when **$y = \infty$.**

$\theta = AB / P'B$ … [circle with infinite radius is a line]

Here **AB** can be a part of a circle with a radius = y = ∞**,**

Central angle subtended by an arc on a circle =

$\theta = AB / P'B = x / P'B$

$\therefore \theta = x / \infty$

$\therefore \theta = 0$ **rad = 0°** **…** [**Any number divided by infinity** is equal to 0]

Since the distinct parts of the lines, namely **P’A** and **P’B** from the point **P’** are originating from the same point and since **θ = 0° (angle**

between P’A and P’B), it is safe to say that these are the same lines when **y = ∞.**

i.e **|P’A| ≅ |P’B|**

. i.e. the lines **P’A = P’B** and are both one and the same and they start and end at the same point **P’ and P,** respectively.

BUT we’ve always had a stationary distance separating these lines, <u>**‘x’**</u> which is not changing throughout the process, which is never going to be **0** even when the distanc**e y = ∞.**

=> $0 < x \leq \infty$

=> $\theta \neq 0$, or $\theta > 0$

This can either be the proof of the statement that the human mind can never comprehend infinity and at infinity, θ is 0 (at an infinite value for **y**) which proves this paradox or that this is not a paradox, and it proves that the mathematical formula for the value of ***$\theta = s / r$*** *from the above equations breaks at a point of infinity.*

Please contact Shimron Alakkal using the below link for any corrections, other opinions, or if you think that there is an error or mishap from my side that has to be addressed.
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Extra details :

- **This can be used in pathiri (a food mostly specific to South India. In other words, a pancake made of rice flour) compression application.**
- **This paradox also proves that lens distortion of an object cannot be solved even if we move the camera or the source of light from each other such that there is an infinite distance between them.**