The New Pythagorean Equation that Applies to all Types of Lines

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Abstract

This working paper proposes a new Pythagorean equation that applies to all types of lines, which the straight lines, curved lines, broken lines and so on, where, the formula will turn into the existing formula if used in the straight lines. Specifically, this equation is very accurate and precise because it implements the concept of Harmony in Gradation-the Formula for Everything. Therefore, the new equation will be very useful for researchers in the fields of physics, biological sciences, and social sciences because, in the reality, we will often encounter a phenomenon which is represented by various types of lines including a straight line.

Keywords: *New Pythagorean Equation; Pythagorean Theorem; Harmony in Gradation-the formula for everything; Pythagorean equilibrium.*

1. Background

In fact, we are often faced with a non-straight line, whether it is a curved line or a broken line. For example, imagine you move straight eastward, from where you are somewhere on the equator, around the earth, then someday you will appear straight from the west to where you originally were, and the track that you think is a collection of several the straight line, it turns out to be an arch. The second example, you make a curve of the exchange rate of the US dollar against the Chinese Yuan for five consecutive days, then you will most likely get five broken lines. The last example, you want to make your body temperature curve with accuracy one-hundredth of a degree, then you will get a large set of the broken lines. In the three examples above, it is very possible that we are very sure that the phenomenon we observe is fulfilling the Pythagorean equation for two or three parameters as the independent variable.

Here, we offer a new concept for applying the Pythagorean Theorem to various types of lines including a straight line, where the equation should change to the general Pythagorean equation when used in a single straight line.

2. Proposed Equation

Proposed Non – Straight Line Equation:

$$\sum_{i=1}^N \left\{ \frac{ds_i^2 / (dx_i^2 + dy_i^2 + dz_i^2)}{\sum \left\{ ds_i^2 / (dx_i^2 + dy_i^2 + dz_i^2) \right\}} \right\}^2 + \sum_{i=1}^N \sum_{j=1}^N \left\{ \frac{ds_i^2 / (dx_i^2 + dy_i^2 + dz_i^2)}{\sum \left\{ ds_i^2 / (dx_i^2 + dy_i^2 + dz_i^2) \right\}} - \frac{ds_j^2 / (dx_j^2 + dy_j^2 + dz_j^2)}{\sum \left\{ ds_j^2 / (dx_j^2 + dy_j^2 + dz_j^2) \right\}} \right\}^2 ; i > j = 1/N \quad (1)$$

If s is a straight line, then $N = 1$ and equation 1 will turn to the following equation:

$$ds^2 = dx^2 + dy^2 + dz^2 \quad (2)$$

If a system does not meet equation 1, in the sense that the system does not have a perfect Pythagorean equilibrium, then the Pythagorean equilibrium level can be calculated using the following equation:

Pythagorean Equilibrium $\leq 1 =$

$$\frac{1}{N * \sum_{i=1}^N \left\{ \frac{ds_i^2 / (dx_i^2 + dy_i^2 + dz_i^2)}{\sum \left\{ ds_i^2 / (dx_i^2 + dy_i^2 + dz_i^2) \right\}} \right\}^2 + \sum_{i=1}^N \sum_{j=1}^N \left\{ \frac{ds_i^2 / (dx_i^2 + dy_i^2 + dz_i^2)}{\sum \left\{ ds_i^2 / (dx_i^2 + dy_i^2 + dz_i^2) \right\}} - \frac{ds_j^2 / (dx_j^2 + dy_j^2 + dz_j^2)}{\sum \left\{ ds_j^2 / (dx_j^2 + dy_j^2 + dz_j^2) \right\}} \right\}^2 ; i > j} \quad (3)$$

3. Calculation Example

i,j	dx ²	dy ²	dz ²	ds ² of the System A	ds ² of the System B	Calculation uses Existing Pythagorean Equation	Calculation uses Proposed Pythagorean Equation
1	1	1	1	3	3.6	System A fulfills, but system B does not meet the existing Pythagorean equation	Both systems A and B meet the new Pythagorean equation proposed in this working paper
2	1	1	2	4	4.8		
3	1	2	2	5	6		
4	2	2	2	6	7.2		

4. CLOSING

This working paper, not only contains the new insight, but also provides homework for all researchers in the world to review the existing formulas they use today, starting with the formula used that causes the research being carried out to have a deadlock. Signs that your formula must be corrected are when decades of theory appear dubious when faced with another theory, or when years of research do not find the right solution. And, more obvious signs are when practitioners begin to question the theories made by academics.

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