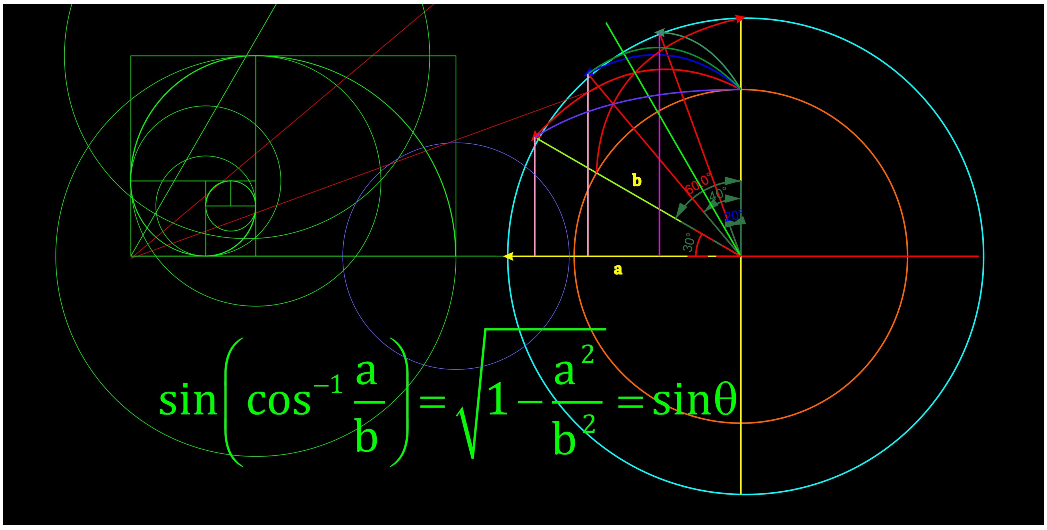

Angle Trisection with Growth Rate of The Golden Ratio

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Abstract

In this paper, we explore the triangulation of angles using the golden ratio and geometric compass principles. By dividing angles into three equal parts based on the golden ratio, we demonstrate a method for solving this geometric problem. Furthermore, we extend our exploration into the third dimension, where a geometric compass can effectively divide a two-dimensional angle into three equal parts. Additionally, our investigation delves into the realm of six-dimensional space-time, where we observe the simultaneous movement of two arms of the compasses based on the golden ratio to achieve the division of every angle into three equal parts. We emphasize the significance of the growth rate associated with the golden ratio in resolving complex mathematical and physical problems. This study provides valuable insights into the application of geometric principles and the golden ratio in solving challenging problems within mathematics and physics.

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1. Introduction

Angle trisection with a compass has been a longstanding challenge throughout ancient times. The act of dividing an angle into three equal parts using only a geometry compass is considered an unsolvable problem. However, it is worth noting that drawing the angle bisector in several steps can effectively achieve the division of certain angles into three equal parts. While there are various methods and approaches to angle trisection, it remains a complex and intricate task that has puzzled mathematicians and scholars for centuries. Despite the challenges associated with this problem, the pursuit of finding a solution continues to captivate and inspire individuals within the mathematical community. There are different ways to Angle trisection [1][2][3].

Probir Roy's proposed method presents a significantly more detailed and comprehensive approach to the subject at hand [4]. With a thorough examination of the intricacies involved, Roy's method offers a comprehensive solution that addresses the multifaceted aspects of the issue. The level of detail in the proposed method allows for a more thorough understanding of the complexities involved, providing a solid foundation for further analysis and implementation. By delving into the nuances of the subject matter, Roy's method offers a more holistic and in-depth perspective, which is essential for addressing the challenges at hand. Overall, Probir Roy's proposed method represents a significant advancement in our understanding and approach to this topic, offering a more nuanced and comprehensive framework for future endeavors in this area In contemplating the nature of unsolvable problems, it is essential to consider the potential for evolving perspectives over time. While trigonometry may present certain limitations, the examination of such challenges through the lens of general balance in the six dimensions of space and time offers a promising avenue for new insights [5]. This theoretical framework posits that by encompassing not only the traditional three spatial dimensions but also the three dimensions of time, a more comprehensive understanding of complex issues can be attained.

By acknowledging the dynamic interplay between space and time, it becomes evident that what may appear insurmountable from a purely trigonometric standpoint could yield alternative approaches that account for temporal dynamics. This underscores the significance of allowing for the evolution of perspectives, as it is through this process that previously unattainable solutions may come into view.

In conclusion, while the constraints of trigonometry may initially seem to render certain problems unsolvable, the broader perspective afforded by the theory of general balance in the six dimensions of space and time suggests that reevaluation over time can lead to fundamentally different outcomes. This underscores the importance of embracing a multidimensional approach in addressing complex challenges.

Events occur over time. For example, a human can pass through several gates like an electron. When drawing a circle with compasses, you follow the number pi. Now, if the circle's radius also changes, you can overcome the limitations in trigonometry. If the fixed arm of the compass or its angle moves in a desired direction at the same time as a compass rotates around its axis, you will overcome all the limitations of trigonometry for angle trisection.

2. Golden ratio

The golden ratio in the six-dimensional space-time arises from the doubling of the time dimension stress concerning the space dimension. In principle, the golden constant follows the doubling ratio. (2.1). In the six-dimensional space-time, the golden constant is directly related to the number pi and the Euler. (2.2). Pi is a different amount over time. (2.3)

$$\frac{1+\sqrt{5}}{2} = \varphi$$

$$\left(\frac{1}{2}\right)^6 \pi^3 \cong \ln(\varphi)$$

$$\pi(past) \times \pi(present) \times \pi(future) = \pi^3$$

The ratio of the circumference to the diameter with the double expansion of the width to the length in a circle has a direct relationship with the eccentricity ratio created. (2.4)

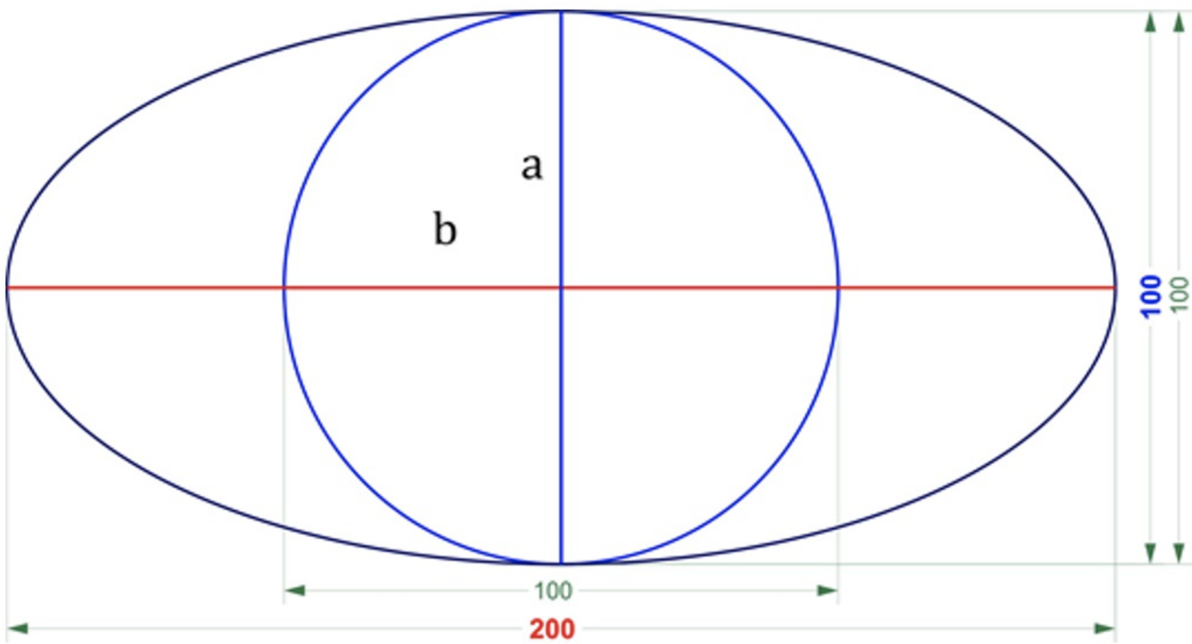

Figure 1. With expansion and eccentricity created in a circle, the ratio of the circumference to the diameter of the circle depends on the growth rate.

When a diameter in an expanding circle has a different speed, the eccentricity of the ellipse occurs. Figure 1. Now the expansion is like two different speeds. Whenever the expansion speed is twice the moving speed, the golden ratio is created. Figure 2. The golden ratio can be obtained using a compass.

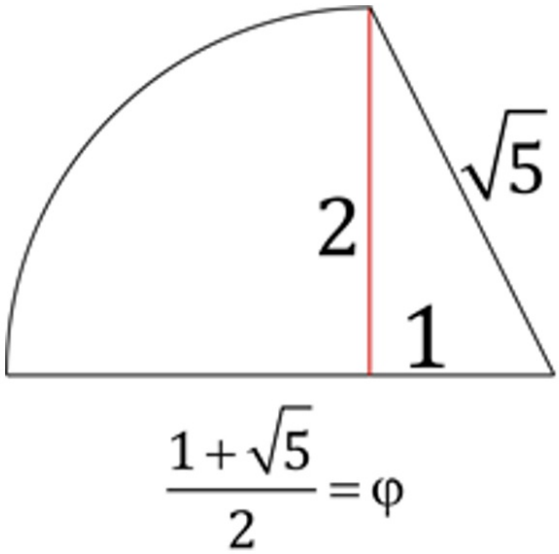

Figure 2. Doubling ratio and pi are factors that create the golden constant

3. Materials and Methods

At the same time as the bow is drawn with a compass, the fixed needle also moves on one of the sides of the angle equal to the opening of the compasses. Figure 3

The rotation speed of a compass is twice the speed of the needle movement. (3.1) By repeating this work on the other side (equal speed of both arms), the angle is divided into two unequal parts. This new part is twice the other part. Figure 4

$$\frac{V_1+\sqrt{V^2_1+V^2_2}}{V_2} = \varphi, \quad \frac{\theta}{V_2} \equiv \frac{V_1+\sqrt{V^2_1+V^2_2}}{V_2}$$

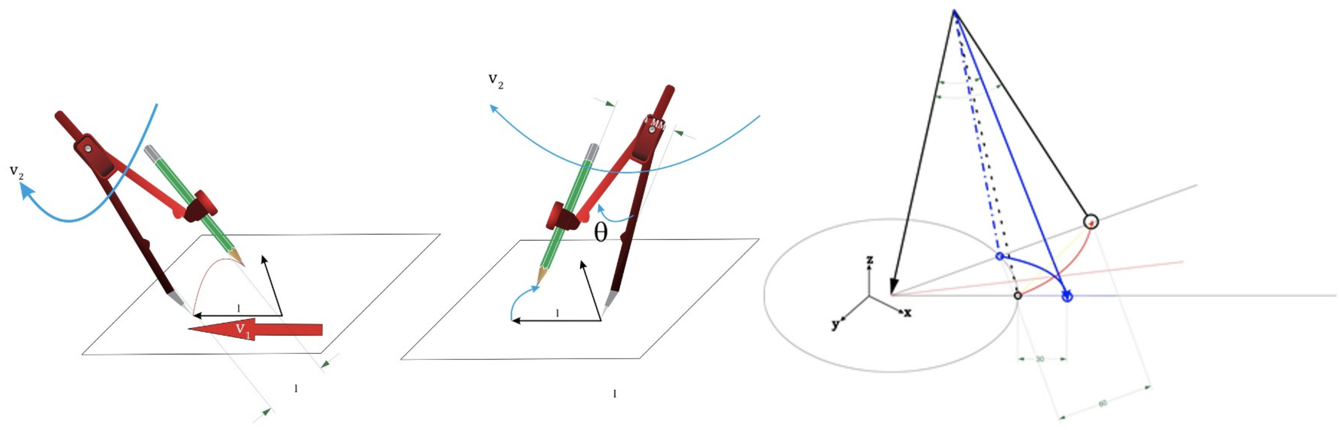

Figure 3. At the same time as the compass rotates, the needle also moves on the line of the angle. At the secondary level, the speed of one arm is twice as much. As the other arm. It is also possible to create golden arcs by changing the angle of the geometry compass to the rotation speed of a compass.

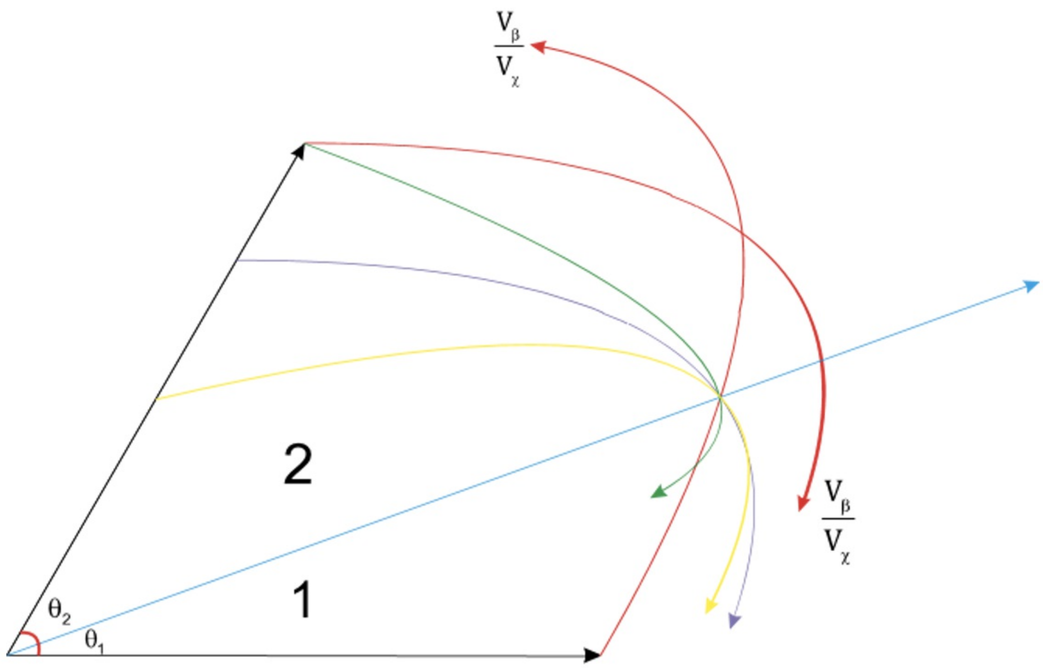

Figure 4. Based on this, by changing the speed and different ratios, there are infinite ways to divide the angle.

As seen in Figure 3, when the angle of a compass is fixed, both arms move. And when one arm is fixed, the angle between the arms changes. Based on drawing the golden points on the sides of the angle, you can calculate the golden ratio between the change of the angle of the compass and the speed of rotation of the compass. Figure 4. As the length of the sides of an angle increases, that angle expands in the plane. Every angle has a golden point outside the opening of the angle. It is not possible to find the exact location of the point. Due to the eccentricity of the ellipse and the double ratio of the golden ratio, the only way is the ratio between the speed of the compass rotation and the change of the angle of the compass. The view is Figure 5, Figure 6

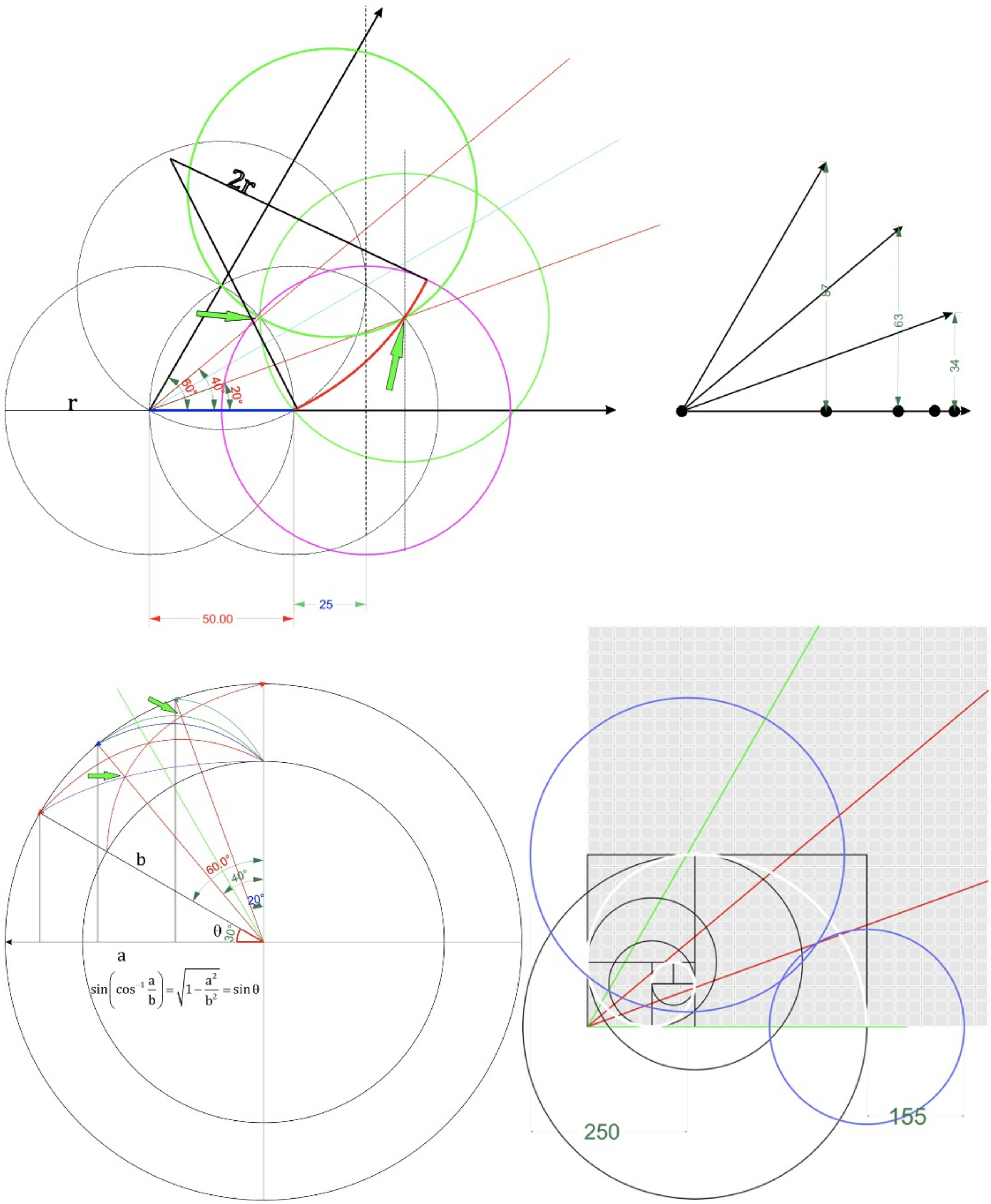

Figure 5. The angle of 60 degrees is divided into three equal parts using the golden ratio in the double speed and the eccentricity of the ellipse.

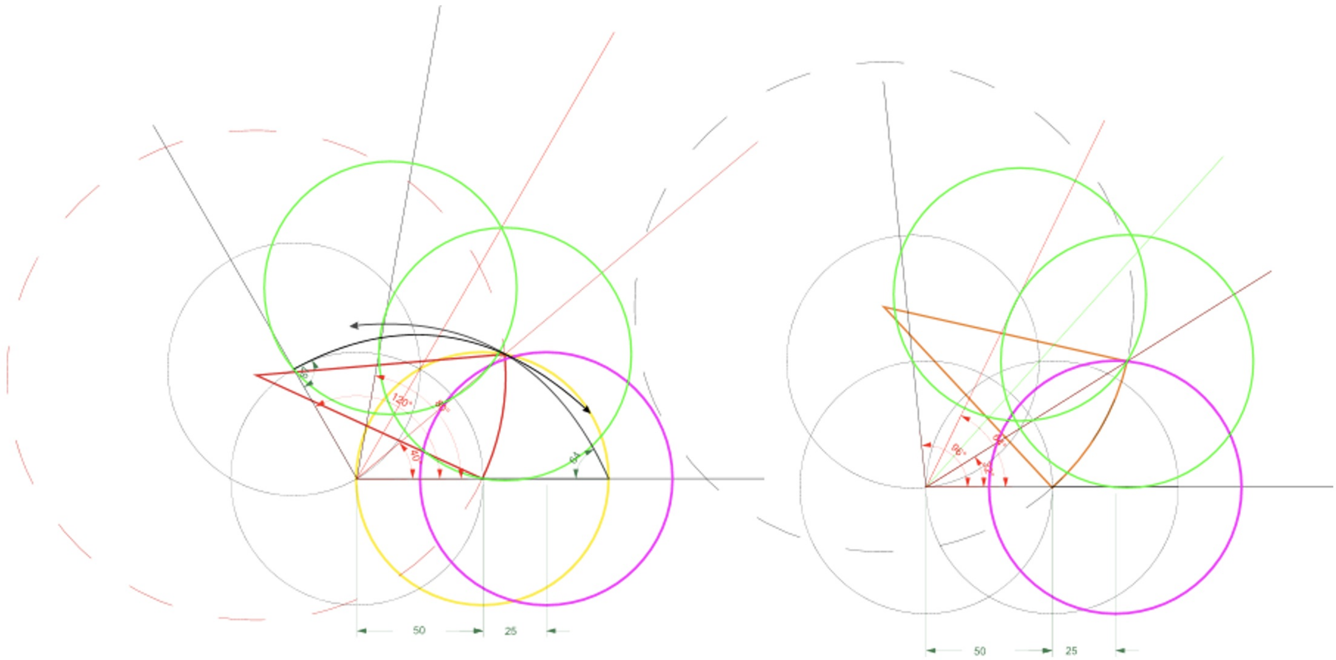

Figure 6. Two angles of 96 degrees and 120 degrees were divided into three equal parts with the same method as before.

4. Results

As a result of this research, complex problems become very simple in higher dimensions. The angle is expanded in the two-dimensional plane. And a compass move in the third dimension. As a result, it can easily divide an angle into two equal parts by using the pi number. To divide the angle into three equal parts, the compass must have an additional movement in the fourth dimension. As a result, if we consider the fourth dimension as time. The compass should have two different movements over time. Simple movements in higher dimensions look very complex from the perspective of lower dimensions. The eccentricity of an ellipse in higher dimensions is expressed by the sine of an angle.

Examining events over time brings different ways to solve unsolved problems in mathematics, geometry, and physics. However, it seems that the nature of the problem has changed. Algebraic operations change over time. There is no certainty for physics and mathematical facts to remain constant over time. Changing the laws of Euclidean geometry in curved spaces shows the reality of time. No equation has certainty over time. And all the facts in the world are dependent on the passing of time. Natural numbers and fundamental natural constants are related to each other.[6] The growth of plants, rain, biological molecules, the growth and metabolism of life organs, the structure of the universe, and chemical reactions can express this relationship. Based on the evaluation of the growth of different systems over time, it is possible to understand the relationship between the three numbers pi, phi, and Euler's number with each other. As the length of the sides of the angle increases, the points chosen to draw the arc should also change. Drawing an ellipse instead of a circle with a compass based on the eccentricity of the ellipse is the basic way to avoid the impossibility of angle trisection. Buffon's needle problem proves the relationship of pi in the past, present, and future times, with Euler's number and the golden constant in the six-dimensional space-time. The method presented in this paper can be used to prove many complex problems by examining events over time. Complex problems such as Hodge's conjecture, Riemann's hypothesis, P versus NP, and ... can also be examined from this point of view.

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