



The parallel postulate, the other four and Relativity

Markos Georgallides

Larnaca (Expelled from Famagusta town occupied by the Barbaric Turks Aug-1974), Cyprus

Email address:

georgallides.marcos@cytanet.com.cy

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Abstract: Because of Geometers scarcity, I was instigated to republish this article and to locate the weakness of proving this Axiom. *Weakness created the Non-Euclid geometries which deviated GR in Space-time confinement*, so ,not conceiving the beyond Planck's existence, *not explaining the WHY speed of light is constant*, and thus the whole universe. In the manuscript is proved that parallel postulate is only in Plane (*three points only and not a Spherical triangle*) based on the four Postulates for Constructions, where all properties of Euclidean geometry compactly exist as Extrema on points, lines, planes, circles and spheres. Projective, Hyperbolic and Elliptic geometry is proved to be an Extrema (deviations) in Euclidean geometry where on them Einstein's theory of general relativity is implicated approximately to the properties of physical space .The universally outstanding denial perception that *Proof by geometric logic only is inaccessible* , *is now contradicted*, and this current knowledge is widely extended.

Keywords: Parallel Postulate, Euclid Geometry and Relativity

1. Introduction

Euclid's elements consist of assuming a small set of intuitively appealing axioms and from them, proving many other propositions (theorems). Although many of Euclid's results have been stated by earlier Greek mathematicians, Euclid was the first to show how these propositions could be fit together into a comprehensive deductive and logical system self consistent. Because nobody until now succeeded to prove the parallel postulate by means of pure geometric logic and under the restrictions imposed to seek the solution, many self consistent non-Euclidean geometries have been discovered based on Definitions, Axioms or Postulates, in order that non of them contradicts any of the other postulates of what actually are or mean. In the manuscript is proved that parallel postulate is only in Plane (three points only) and is based on the four Postulates for Constructions, where all properties of Euclidean geometry compactly exist as Extrema on points, lines, planes, circles and spheres. Projective, Hyperbolic and Elliptic geometry is proved to be an Extrema (deviations) [16] in Euclidean geometry where on them Einstein's theory of general relativity is implicated and calls a segment as line and the disk as plane in physical space.

It have been shown that the only Space-Energy geometry is the Euclidean, on primary and on any vector unit AB, (AB = The Quantization of points and of Energy on AB vector) on

the contrary to the general relativity of Space-time which is based on the rays of the non-Euclidean geometries and to the limited velocity of light. Euclidean geometry describes Space-Energy beyond Plank's length level and also in its deviations which are described as Space-time in Plank's length level. Quantization is holding only on points and Energy [Space-Energy] ,where Time is vanished [PNS], and not on points and Time [Space-time] which is the deviation of Euclidean geometry. [21]

2. Euclid Elements for a Proof of the Parallel Postulate (Axiom)

Axiom or Postulate is a statement checked if it is true and is ascertained with logic (the experiences of nature as objective reality).

Theorem or Proposition is a non-main statement requiring a proof based on earlier determined logical properties.

Definition is an initial notion without any sensible definition given to other notions.

Definitions, Propositions or Postulates created Euclid geometry using the geometrical logic which is that of nature, the logic of the objective reality.

Using the same elements it is possible to create many other geometries but the true uniting element is the before refereed.

2.1. The First Definitions (D) of Terms in Geometry

D1: A point is that which has no part (Position)

D2: A line is a breathless length (for straight line, the whole is equal to the parts)

D3: The extremities of lines are points (equation).

D4: A straight line lies equally with respect to the points on itself (identity).

D: A midpoint C divides a segment AB (of a straight line) in two. $CA = CB$ any point C divides all straight lines through this in two.

D: A straight line AB divides all planes through this in two.

D: A plane ABC divides all spaces through this in two

2.2. Common Notions (Cn)

Cn1: Things which equal the same thing also equal one another.

Cn2: If equals are added to equals, then the wholes are equal.

Cn3: If equals are subtracted from equals, then the remainders are equal.

Cn4: Things which coincide with one another, equal one another.

Cn5: The whole is greater than the part.

2.3. The Five Postulates (P) for Construction

P1. To draw a straight line from any point A to any other B.

P2. To produce a finite straight line AB continuously in a straight line.

P3. To describe a circle with any centre and distance. P1, P2 are unique.

P4. That, all right angles are equal to each other.

P5. That, if a straight line falling on two straight lines make the interior angles on the same side less than two right angles, if produced indefinitely, meet on that side on which are the angles less than the two right angles, or (for three points on a plane)

5a. The same is plane's postulate which states that, from any point M, not on a straight line AB, only one line MM' can be drawn parallel to AB.

Since a straight line passes through two points only and because point M is the third then the parallel postulate it is valid on a plane (three points only).

3. The Method

AB is a straight line through points A, B and M any other point. When $MA+MB > AB$ then point M is not on AB. (differently if $MA+MB = AB$ then this answers the question of why any line contains at least two points i.e. for any point M on line AB where is holding $MA+MB = AB$ / meaning that lines MA, MB coincide on AB / is thus proved from the other axioms and so D2 is not an axiom).

To prove that, one and only one line MM' can be drawn

parallel to AB.

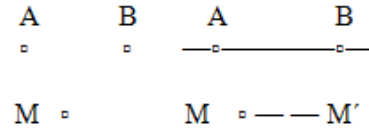


Figure 1. The three points (a plane)

To prove the above Axiom is necessary to show:

- The parallel to AB is the locus of all points at a constant distance h from the line AB, and for point M is $MA \perp$,
- The locus of all these points is a straight line.

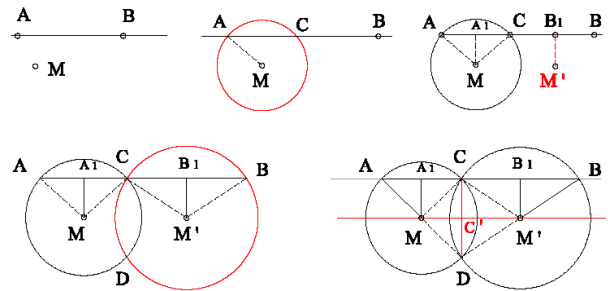


Figure 2. The Method - (3)

Step 1

Draw the circle (M, MA) be joined meeting line AB in C. Since $MA = MC$, point M is on mid-perpendicular of AC. Let A_1 be the midpoint of AC, (it is $A_1A + A_1C = AC$ because A_1 is on the straight line AC. Triangles MAA_1 , MCA_1 are equal because the three sides are equal, therefore angle $\angle MA_1A = \angle MA_1C$ (CN1) and since the sum of the two angles $\angle MA_1A + \angle MA_1C = 180^\circ$ (CN2, 6D) then angle $\angle MA_1A = \angle MA_1C = 90^\circ$. (P4) so, MA_1 is the minimum fixed distance h of point M to AC.

Step 2

Let B_1 be the midpoint of CB, (it is $B_1C + B_1B = CB$ because B_1 is on the straight line CB) and draw $B_1M' = h$ equal to A_1M on the mid-perpendicular from point B_1 to CB. Draw the circle $(M', M'B = M'C)$ intersecting the circle $(M, MA = MC)$ at point D. (P3) Since $M'C = M'B$, point M' lies on mid-perpendicular of CB. (CN1)

Since $M'C = M'D$, point M' lies on mid-perpendicular of CD. (CN1) Since $MC = MD$, point M lies on mid-perpendicular of CD. (CN1) Because points M and M' lie on the same mid-perpendicular (This mid-perpendicular is drawn from point C' to CD and it is the midpoint of CD) and because only one line MM' passes through points M, M' then line MM' coincides with this mid-perpendicular (CN4)

Step 3

Draw the perpendicular of CD at point C' . (P3, P1)

- Because $MA_1 \perp AC$ and also $MC' \perp CD$ then angle $\angle A_1MC' = \angle A_1CC'$. (Cn 2, Cn3, E.I.15) Because $M'B_1 \perp CB$ and also $M'C' \perp CD$ then angle $\angle B_1M'C' = \angle B_1CC'$. (Cn2, Cn3, E.I.15)

- The sum of angles $\angle A_1CC' + \angle B_1CC' = 180^\circ = \angle A_1MC' +$

- $B1M'C'$. (6.D), and since Point C' lies on straight line MM' , therefore the sum of angles in shape $A1B1M'M$ are $< MA1B1 + A1B1M' + [B1M'M + M'MA1] = 90^\circ + 90^\circ + 180^\circ = 360^\circ$ (Cn2), i.e. The sum of angles in a Quadrilateral is 360° and in Rectangle all equal to 90° . (m)
- c. The right-angled triangles $MA1B1$, $M'B1A1$ are equal because $A1M = B1M'$ and $A1B1$ common, therefore side $A1M' = B1M$ (Cn1). Triangles $A1MM'$, $B1M'M$ are equal because have the three sides equal each other, therefore angle $< A1MM' = B1M'M$, and since their sum is 180° as before (6D), so angle $< A1MM' = B1M'M = 90^\circ$ (Cn2).
- d. Since angle $< A1MM' = A1CC'$ and also angle $< B1M'M = B1CC'$ (P4), therefore quadrilaterals $A1CC'M$, $B1CC'M'$, $A1B1M'M$ are Rectangles (CN3). From the above three rectangles and because all points (M, M' and C') equidistant from AB, this means that C'C is also the minimum equal distance of point C' to line AB or, $h = MA1 = M'B1 = CD / 2 = C'C$ (Cn1) Namely, line MM' is perpendicular to segment CD at point C' and this line coincides with the mid-perpendicular of CD at this point C' and points M, M', C' are on line MM' . Point C' equidistant, h, from line AB, as it is for points M, M', so the locus of the three points is the straight line MM' , so the two demands are satisfied, ($h = C'C = MA1 = M'B1$ and also $C'C \perp AB$, $MA1 \perp AB$, $M'B1 \perp AB$). (o.e.d.)
- e. The right-angle triangles $A1CM$, MCC' are equal because side $MA1 = C'C$ and MC common so angle $< A1CM = C'MC$, and the Sum of angles $C'MC + MCB1 = A1CM + MCB1 = 180^\circ$

3.1. The Succession of Proofs

1. Draw the circle (M, MA) be joined meeting line AB in C and let A1, B1 be the midpoint of CA, CB.
2. On mid-perpendicular $B1M'$ find point M' such that $M'B1 = MA1$ and draw the circle (M', $M'B = M'C$) intersecting the circle (M, $MA = MC$) at point D.
3. Draw mid-perpendicular of CD at point C'.
4. To show that line MM' is a straight line passing through point C' and it is such that $MA1 = M'B1 = C'C = h$, i.e. a constant distance h from line AB or, also The Sum of angles $C'MC + MCB1 = A1CM + MCB1 = 180^\circ$

3.2. Proofed Succession

1. The mid-perpendicular of CD passes through points M, M'.
2. Angle $< A1MC' = A1MM' = A1CC'$, Angle $< B1M'C' = B1M'M = B1CC'$ $< A1MC' = A1CC'$ because their sides are perpendicular among them i.e. $MA1 \perp CA$, $MC' \perp CC'$.
 - a. In case $< A1MM' + A1CC' = 180^\circ$ and $B1M'M + B1CC' = 180^\circ$ then $< A1MM' = 180^\circ - A1CC'$, $B1M'M = 180^\circ - B1CC'$, and by summation $< A1MM' + B1M'M = 360^\circ - A1CC' - B1CC'$ or Sum

of angles $< A1MM' + B1M'M = 360 - (A1CC' + B1CC') = 360 - 180^\circ = 180^\circ$

3. The sum of angles $A1MM' + B1M'M = 180^\circ$ because the equal sum of angles $A1CC' + B1CC' = 180^\circ$, so the sum of angles in quadrilateral $MA1B1M'$ is equal to 360° .
4. The right-angled triangles $MA1B1$, $M'B1A1$ are equal, so diagonal $MB1 = M'A1$ and since triangles $A1MM'$, $B1M'M$ are equal, then angle $A1MM' = B1M'M$ and since their sum is 180° , therefore angle $< A1MM' = M'MB1 = M'B1A1 = B1A1M = 90^\circ$
5. Since angle $A1CC' = B1CC' = 90^\circ$, then quadrilaterals $A1CC'M$, $B1CC'M'$ are rectangles and for the three rectangles $MA1CC'$, $CB1M'C'$, $MA1B1M'$ exists $MA1 = M'B1 = C'C$
6. The right-angled triangles $MCA1$, MCC' are equal, so angle $< A1CM = C'MC$ and since the sum of angles $< A1CM + MCB1 = 180^\circ$ then also $C'MC + MCB1 = 180^\circ \rightarrow$ which is the second to show, as this problem has been set at first by Euclid.

All above is a Proof of the Parallel postulate due to the fact that the parallel postulate is dependent of the other four axioms (now is proved as a theorem from the other four). Since AB is common to ∞ Planes and only one Plane is passing through point M (Plane ABM from the three points A, B, M, then the Parallel Postulate is valid for all Spaces which have this common Plane, as Spherical, n-dimensional geometry Spaces. It was proved that it is a necessary logical consequence of the others axioms, agree also with the Properties of physical objects, $d + 0 = d$, $d * 0 = 0$, now is possible to decide through mathematical reasoning, that the geometry of the physical universe is Euclidean. Since the essential difference between Euclidean geometry and the two non-Euclidean geometries Spherical and hyperbolic geometry, is the nature of parallel line, i.e. the parallel postulate so, <<The consistent System of the - non-Euclidean geometry - have to decide the direction of the existing mathematical logic >>.

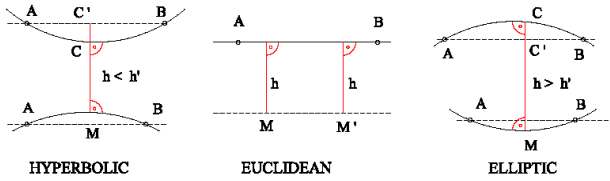
The above consistency proof is applicable to any line Segment AB on line AB, (segment AB is the first dimensional unit, as $AB = 0 \rightarrow \infty$), from any point M not on line AB, $[MA + MB > AB]$ for three points only which consist the Plane. For any point M between points A, B is holding $MA + MB = AB$ i.e. from two points M, A or M, B passes the only one line AB. A line is also continuous (P1) with points and discontinuous with segment AB [14], which is the metric defined by non- Euclidean geometries, and it is the answer to the cry about the < crisis in the foundations of Euclid geometry > (F.2)

3.3. A Line Contains at Least Two Points, is Not an Axiom Because is Proved as Theorem

Definition D2 states that for any point M on line AB is holding $MA + MB = AB$ which is equal to < segment MA + segment MB is equal to segment AB > i.e. the two lines MA, MB coincide on line AB and thus this postulate is proved also from the other axioms, thus D2 is not an axiom, which

form a system self consistent with its intrinsic real-world meaning. $F.a \rightarrow F.2$.

4. The Types of Geometry



The structure of euclidean geometry

Figure 3. (Hyperbolic – Euclidean - Elliptic)- (4)

Any single point A constitutes a Unit without any Position and dimension (non-dimensional = Empty Space) simultaneously zero, finite and infinite. The unit meter of Point is equal to 0.

Any single point B, not coinciding with A, constitutes another one Unit which has also dimension zero. Only one Straight line (i.e. the Whole is equal to the Parts) passes through points A and B, which consists another un-dimensional Unit since is consisted of infinite points with dimension zero. A line Segment AB between points A and B (either points A and B are near zero or are extended to the infinite), consists the first Unit with one dimensional, the length AB, beginning from Unit A and a regression ending in Unit B. $AB = 0 \rightarrow \infty$, is the one-dimensional Space. The unit meter of AB is $m = 2.(AB/2) = AB$ because only one middle point exists on AB and since also is composed of infinite points which are filling line, then nature of line is that of Point (the all is one for Lines and Points).

Adding a third point C, outside the straight line AB, ($CA+CB > AB$), then is constituted a new Unit (the Plane) without position, since is consisted of infinite points, without any position. Shape ABC enclosed between parts AB, AC, BC is of two dimensional, the enclosed area ABC, and since is composed of infinite Straight lines which are filling Plane, then, nature of Plane is that of Line and that of Points (the all is one for Planes, Lines and Points). Following harmony of unit meter $AB=AC=BC$, then Area $ABC = 0 \rightarrow \infty$, is the two-dimensional Space with unit meter equal to $m = 2.(\pi.AB/\sqrt{2})^2 = \pi.AB^2$, i.e. one square equal to the area of the unit circle.

Four points A,B,C,D (....) not coinciding, consist a new Unit (the Space or Space Layer) without position also, which is extended between the four Planes and all included, forming Volume ABCD and since is composed of infinite Planes which are filling Space, then, nature of Space is that of Plane and that of Points (the all is one for Spaces, Planes, Lines and Points). Following the same harmony of the first Unit, shape ABCD is the Regular Tetrahedron with volume $ABCD = 0 \rightarrow \infty$, and it is the three-dimensional Space. The dimension of Volume is $4 - 1 = 3$. The unit measure of volume is the side X of cube X^3 twice the volume of another random cube of side $a = AB$ such as $X^3 = 2.a^3$ and $X = \sqrt[3]{2}.a$. Geometry measures Volumes with side X related to the problem of doubling of the cube. In case that point D is on a lower Space Layer, then

all Properties of Space, or Space Layer are transferred to the lower corresponding Unit, i.e. from volume to Plane from Plane the Straight line and then to the Point. This Concentrated (Compact) Logic of geometry [CLG] exists for all Space – Layers and is very useful in many geometrical and physical problems. (exists, Quality = Quantity, since all the new Units are produced from the same, the first one, dimensional Unit AB).

N points represent the N-1 dimensional Space or the N-1 Space Layer, DL, and has analogous properties and measures. Following the same harmony for unit AB, ($AB = 0 \rightarrow \infty$) then shape $ABC...M$ (i.e. the ∞ spaces $AB = 1, 2, ...nth$) is the Regular Solid in Sphere $ABC...M = 0 \rightarrow \infty$. This N Space Layer is limiting to ∞ as $N \rightarrow \infty$. Proceeding inversely with roots of any unit $AB = 0 \rightarrow \infty$ (i.e. the Sub-Spaces are the roots of AB, $\sqrt[2]{AB}, \sqrt[3]{AB}, ... \sqrt[n]{AB}$ then it is $\sqrt[n]{AB} = 1$ as $n \rightarrow \infty$), and since all roots of unit AB are the vertices of the Regular Solids in Spheres then this n Space Layer is limiting to 0 as $n \rightarrow \infty$. The dimensionality of the physical universe is unbounded (∞) but simultaneously equal to (1) as the two types of Spaces and Sub-Spaces show.

Because the unit-meters of the N-1 dimensional Space Layers coincide with the vertices of the nth-roots of the first dimensional unit segment AB as $AB = \infty \rightarrow 0$, which is point, (the vertices of the n-sided Regular Solids), therefore the two Spaces are coinciding (the Space Layers and the Sub-Space Layers are in superposition on the same monads).[F.5]

That is to say, Any point on the Nth Space or Space-Layer, of any unit $AB = 0 \rightarrow \infty$, jointly exists partly or whole, with all Subspaces of higher than N Spaces, $N = (N+1) - 1 = (N+2) - 2 = (N+N) - N = (N+\infty) - \infty$, where $(N+1), ... (N+\infty)$ are the higher than N Spaces, and with all Spaces of lower than N Subspaces, $N = (N-1) + 1 = (N-2) + 2 = (N-N) + N = (N-\infty) + \infty$, where $(N-1), (N-2), (N-N), (N-\infty)$ are the lower than N Spaces. The boundaries of N points, corresponding to the Space, have their unit meter of the Space and is a Tensor of N dimension (i.e. the unit meters of the N roots of unity AB), simultaneously, because belonging to the Sub-Space of the Unit Segments $> N$, have also the unit meter of all spaces. [F.5]

1. The Space Layers: (or the Regular Solids) with sides equal to $AB = 0 \rightarrow \infty$ The Increasing Plane Spaces with the same Unit. (F.3)

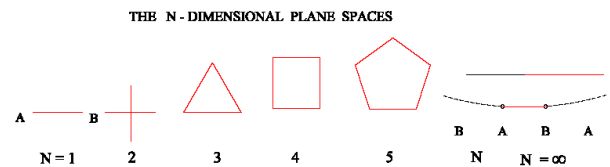


Figure 4. The Increasing Space Layers –(4)

The Sub-Space Layers : (or the Regular Solids on AB) as Roots of $AB = 0 \rightarrow \infty$ The Decreasing Plane Spaces with the same Unit. (F.4)

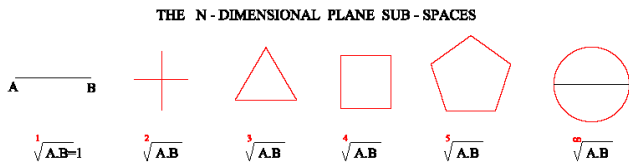


Figure 5. The decreasing (Sub-Spaces) Layers – (4)

2. The superposition of Plane Space Layers and Sub-Space Layers: (F.5) The simultaneously co-existence of Spaces and Sub-Spaces of any Unit $AB = 0 \rightarrow \infty$, i.e. Euclidean, Elliptic, Spherical, Parabolic, Hyperbolic, Geodesics, metric and non-metric geometries have Unit AB as common. The Interconnection of Homogeneous and Heterogeneous Spaces, and Subspaces of the Universe. [F.5]

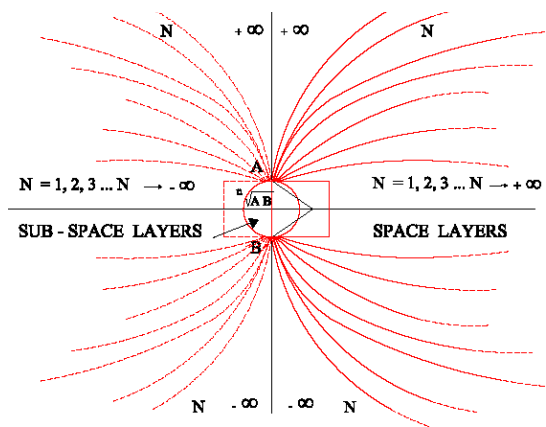


Figure 6. The Superposition of Spaces – (4)

3. A linear shape is the shape with N points on a Plane bounded with straight lines. A circle is the shape on a Plane with all points equally distance from a fix point O . A curved line is the shape on a Plane with points not equally distance from a fix point O . Curved shapes are those on a Plane bounded with curved lines. Rotating the above axial-centrifugally (machine $AB \perp AC$) is obtained Flat Space, Conics, Sphere, Curved Space, multi Curvature Spaces, Curved Hyperspace etc. The fact that curvature changes from point to point, is not a property of one Space only but that of the common area of more than two Spaces, namely the result of the Position of Points. Euclidean manifold (Point, sectors, lines, Planes, all Spaces etc) and the one dimensional Unit AB is proved to be the same thing (according to Euclid $\epsilon\nu\ \tau\o\ \pi\acute{\alpha}\nu$). [F.5]

Since Riemannian metric and curvature is on the great circles of a Sphere which consist a Plane, say AMA' , while the Parallel Postulate is consistent with three points only, therefore the great circles are not lines (this is because it is $MA + MA' > AA'$) and the curvature of Space is that of the circle in this Plane, i.e. that of the circle (O, OA) , which are more than three points. Because Parallel Axiom is for three points only, which consist a Plane, then the curvature of $<$ empty space $>$ is equal to 0, (has not metric or intrinsic

curvature). [F.6]

The physical laws are correlated with the geometry of Spaces and can be seen, using CLG, in Plane Space as it is shown in figures F3 - F5. A marvellous Presentation of the method can be seen on Dr Geo-Machine Macro-constructions.

Perhaps, Inertia is the Property of a certain Space Layer, which is the conserved work as a field, and the Interaction of Spaces happening at the Commons (Horizon of Space, Anti-Space) or those have been called Concentrated Logic = Spin, and so create the motion. [21] .

Today has been shown in [38] that this common horizon is the common circle of Space, Anti-space equilibrium, which creates breakages and by collision all particles ,dark matter and dark energy exist in these Inertial systems.

Gravity field is one of the finest existing Space and Anti-space quantization, which is restrained by gravity force.

Hyperbolic geometry and straight lines:

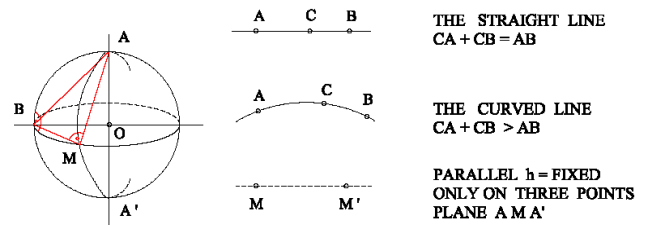


Figure 7. The Euclidean straight line and the others – (4)

The parallel axiom (the postulate) on any Segment AB in empty Space is experimentally verifiable, and in this way it is dependent of the other Axioms and is logically consistent, and since this is true then is accepted and so the Parallel Postulate as has been shown is a Parallel Axiom, so all Nature (the Universe as objective reality) is working according to the Principles (the patterns), the Properties and the dialectic logic of the Euclidean geometry. [17]

Hyperbolic and Projective geometry transfers the Parallel Axiom to problem of a point M and a Plane $AB-C$ instead of problem of three points only, a Plane, which such it is .(F.6)

Vast (the empty space) is simultaneously ∞ and 0 for every unit AB , as this is for numbers. Uniformity ($P4 =$ Homogenous Plane) of Empty Space creates, all the one dimensional units, the Laws of conservation for Total Impulse, and moment of Inertia in Mechanics, independently of the Position of Space and regardless the state of motion of other sources. (Isotropic Spaces) Uniformity (Homogenous) of Empty Time creates, the Laws of conservation of the Total Energy regardless of the state of motion (Time is not existing here, since Timing is always the same as zero) and Time Intervals are not existing.[17]. It was shown in [38] that *Time is the conversion factor between the conventional units (second) and length units (meter)*.

In Special Relativity events from the origin are determined by a velocity and a given unit of time, and the position of an observer is related with that velocity after the temporal unit.

Since all Spaces and Subspaces co-exist, then Past, Present and Future simultaneously exist on different Space Layer. Odd and Even Spaces have common and opposite

Properties,(the regular Odd and Even regular Polygons on any dimensional Unit) so for Gravity belonging to different Layers as that of particles, is also valid in atom Layers. Euclidean geometry with straight lines is extended beyond Standard Model ($AB < 10^{-33}m$) from that of general relativity where Spaces may be simultaneously Flat or Curved or multi-Curved, and according to the Concentrated, (Compact) Logic of the Space, are below Planck's length Level, so the changing curvature from point to point is possible in the different magnitudes of particles. In Planck length level and Standard Model, upper speed is that of light, while beyond Planck length a new type of light is needed to see what is happening.

5. Respective Figures

5.1. Rational Figured Numbers or Figures

This document is related to the definition of “Heron” that gnomon is as that which, when added to anything, a number or figure, makes the whole similar to that to which it is added. In general the successive gnomonic numbers for any polygonal number, say, of n sides have $n-2$ for their common difference. The odd numbers successively added were called gnomons. See Archimedes (Heiberg 1881, page 142,ε.) The Euclidean dialectic logic of an axiom is that which is true in itself.

This logic exists in nature (objective logic) and is reflected to our minds as dialectic logic of mind. Shortly for ancient Greeks was, (μηδέν ἐν τῇ νοήσῃ ἐμὴ πρότερον ἐν τοῖ αἰσθήσοι) i.e. there is nothing in our mind unless it passes through our senses. Since the first dimensional Unit is any Segment AB, it is obvious that all Rational Segments are multiples of AB potentially the first polygonal number of any form, and the first is $2AB = AB + AB$, which shows that multiplication and Summation is the same action with the same common base, the Segment AB. To Prove in F7 :

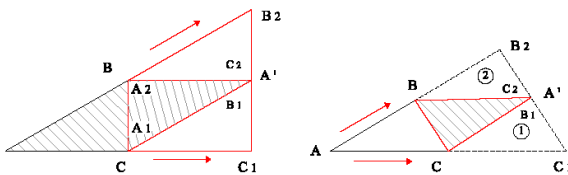


Figure 8. The Rational figures – (5.1)

The triangle with sides AC_1, AB_2, C_1B_2 twice the length of initial segments AC, AB, CB preserves the same angles $\angle A = \angle BAC$, $\angle B = \angle ABC$, $\angle C = \angle ACB$ of the triangle. Proof :

- Remove triangle ABC on line AC such that point A coincides with point C (A_1). Triangles CB_1C_1 , ABC are equal, so $CA' = AB$, $C_1A' = CB$
- Remove triangle ABC on line AB such that point A coincides with point B (A_2). Triangles BB_2C_2 , ABC are equal, so $BC_2 = AC$, $B_2C_2 = BC$
- The two circles ($C, CB_1 = AB$) and ($B, BC_2 = AC$) determine by their intersection point A' , so triangles CBA' , CBA are equal, and also equal to the triangles

CC_1B_1 , BB_2C_2 , and this proposition states that sides $CB_1 = CA'$, $BC_2 = BA'$. Point A' must simultaneously lie on circles (C_1, C_1B_1), (B_2, B_2C_2), which is not possible unless point A' coincides with points B_1 and C_2 .

- This logic exists in Mechanics as follows : The linear motion of a Figure or a Solid is equivalent to the linear motion of the gravity centre because all points of them are linearly displaced, so 1st Removal ---- $BB_1 = AC$, $CB_1 = AB$, $BC = BC$ 2nd Removal ---- $CC_2 = AB$, $BC_2 = AC$, $BC = BC$ 1st + 2nd Removal ---- $CB_1 = AB$, $BC_2 = AC$, $BC = BC$ which is the same. Since all degrees of freedom of the System should not be satisfied therefore points B_1 , C_2 , A' coincide.
- Since circles ($C_1, C_1B_1 = C_1A' = CB$), ($B_2, B_2C_2 = B_2A' = CB$) pass through one point A' , then $C_1A'B_2$ is a straight line, this because $C_1A' + A'B_2 = C_1B_2$, and A' is the midpoint of segment B_2C_1 .
- By reasoning similar to what has just been given, it follows that the area of a triangle with sides twice the initials, is four times the area of the triangle.
- Since the sum of angles $\angle C_1A'C + \angle CA'B + \angle BA'B_2 = 180^\circ$ ($6D$) and equal to the sum of angles $\angle CBA + \angle CAB + \angle ACB$ then the Sum of angles of any triangle ABC is 180° , which is not depended on the Parallel theorem or else-where.

This proof is a self consistent logical system

Verification :

Let be the sides $a=5$, $b=4$, $c=3$ of a given triangle and from the known formulas of area $S = (a + b + c) / 2 = 6$, Area $= \sqrt{6 \cdot 1 \cdot 2 \cdot 3} = 6$ For $a=10$, $b=8$, $c=6$ then $S = 24/2 = 12$ and Area $= \sqrt{12 \cdot 2 \cdot 4 \cdot 6} = 24 = 4 \times 6$ (four times as it is)

5.2. A given Point P and Any Circle (O, OA)

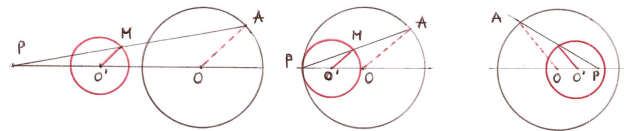


Figure 9. A point and a circle – (5.2)

- Point P is outside the circle.
- Point P on circle.
- Point P in circle.

To Prove :

The locus of midpoints M of segments PA , is a circle with center O' at the middle of PO

and radius $O'M = OA / 2$ where, P is any point on a Plane A is any point on circle (O, OA) M is mid point of segment PA , Proof :

Let O' and M be the midpoints of PO , PA . According to the previous given for Gnomon, the sides of triangle POA are twice the size of $PO'M$, or $PO = 2 \cdot PO'$ and $PA = 2 \cdot PM$ therefore as before, $OA = 2 \cdot O'M$, or $O'M = OA/2$.

Assuming M found, and Since O' is a fixed point, and $O'M$ is constant, then $(O', O'M = OA/2)$ is a circle. For point P on the circle : The locus of the midpoint M of chord PA is

the circle ($O'O'M = PO / 2$) and it follows that triangles OMP, OMA are equal which means that angle $\angle OMP = \angle OMA = 90^\circ$, i.e. the right angle $\angle PMO = 90^\circ$ and exists on diameter PO (on arc PO), and since the sum of the other two angles $\angle MPO + \angle MOP$ exist on the same arc $PO = PM + MO$, it follows that the sum of angles in a rectangle triangle is $90 + 90 = 180^\circ$

5.3. The two Angles Problem

Any two angles $\alpha = \angle AOB$, $\beta = \angle A'O'B'$ with perpendicular, sides are equal.

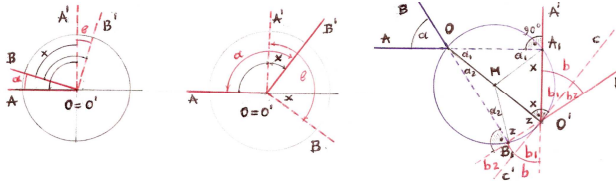


Figure 10. The two perpendicular angles – (5.3)

$$O = O' \quad O = O' \quad O \neq O'$$

angle $\alpha \leq 90^\circ$ angle $\alpha > 90^\circ$ any angle

Rotation of $\alpha = \beta$ Rotating of $\alpha = \beta$ Displacing of $\alpha = \beta$

Let $\angle AOB = a$ be any given angle and angle $\angle A'O'B' = b$ such that $AO \perp O'A'$, $OB \perp O'B'$.

To proof that angle b is equal to a .

Proof :

CENTRE $O' = O$, $\alpha \leq 90^\circ$

Angle $\angle AOA' = 90^\circ = \angle AOB + \angle BOA' = \alpha + x$ (1)

Angle $\angle BOB' = 90^\circ = \angle BOA' + \angle A'OB' = x + \beta$ (2),

subtracting (1), (2) \rightarrow angle $\beta = \alpha$

CENTRE $O' = O$, $90^\circ < \alpha < 180^\circ$

Angle $\angle AOA' = 90^\circ = \angle AOB' - \angle BOA' = \alpha - x$ (1)

Angle $\angle BOB' = 90^\circ = \angle A'OB - \angle A'OB' = \beta - x$ (2),

subtracting (1), (2) \rightarrow angle $\beta = \alpha$

CENTRE $O' \neq O$.

Draw circle (M, $MO = MO'$) with OO' as diameter intersecting $OA, O'B'$ produced to points A_1, B_1 .

Since the only perpendicular from point O to $O'A'$ and from point O' to OB is on circle (M, MO)

then, points A_1, B_1 are on the circle and angles $\angle O'A_1O$, $\angle O'B_1O$ are equal to 90° .

The vertically opposite angles $a = a_1 + a_2$, $b = b_1 + b_2$ where $O'C \perp OO'$.

Since $MO = MA_1$ then angle $\angle MOA_1 = \angle MA_1O = a_1$.

Since $MA_1 = MO'$ then angle $\angle MA_1O' = \angle MO'A_1 = x$

Since $MO' = MB_1$ then angle $\angle MO'B_1 = \angle MB_1O' = z$

Angle $\angle MO'C = 90^\circ = x + b_1 = z + b_2$.

Angle $\angle O'A_1O = 90^\circ = x + a_1 = x + b_1 \rightarrow a_1 = b_1$

Angle $\angle O'B_1O = 90^\circ = z + a_2 = z + b_2 \rightarrow a_2 = b_2$

By summation $a_1 + a_2 = b_1 + b_2$ or $b = a$ (o.e.d) i.e. any two angles a, b having their sides perpendicular among them are equal.

From upper proof is easy to derive the Parallel axiom, and more easy from the Sum of angles on a right-angled triangle.

5.4. Any Two Angles Having their Sides Perpendicular among them are Equal or Supplementary [F.10]

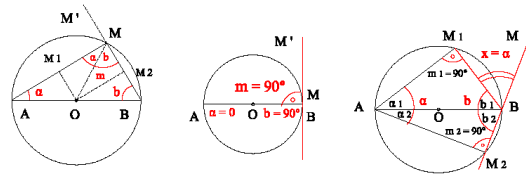


Figure 11. The two perpendicular supplementary angles – (5.4)

$AB = \text{Diameter } M \rightarrow B, AB \perp BM', AM_1 \perp BM_1,$

$$AM_2 \perp BM_2 = AM_2 \perp BM$$

Let angle $\angle M_1AM_2 = a$ and angle $\angle M_1BM_2 = b$,

which have side $AM_1 \perp BM_1$ and side

$$AM_2 \perp BM_2 \perp BM$$

Show :

1. Angle $\angle M_1AM_2 = \angle M_1BM_2 = a$

2. Angle $\angle M_1AM_2 + \angle M_1BM_2 = a + b = 180^\circ$.

3. The Sum of angles in Quadrilateral AM_1BM_2 is 360° .

4. The Sum of angles in Any triangle AM_1M_2 is 180° .

Proof :

1. In figure 10.3, since $AM_1 \perp BM_1$ and $AM_2 \perp BM_2$ or the same $AM_2 \perp BM$, then according to prior proof, AB is the diameter of the circle passing through points M_1, M_2 , and exists $a_1 + b_1 = m_1 = 90^\circ$, $a_2 + b_2 = m_2 = 90^\circ$ and by summation $(a_1 + b_1) + (a_2 + b_2) = 180^\circ$ or $(a_1 + a_2) + (b_1 + b_2) = a + b = 180^\circ$, and since also $x + b = 180^\circ$ therefore angle $\angle x = a$

2. Since the Sum of angles $\angle M_1BM_2 + \angle M_1BM = 180^\circ$ then $a + b = 180^\circ$

3. The sum of angles in quadrilateral AM_1BM_2 is $a + b + 90 + 90 = 180 + 180 = 360^\circ$

4. Since any diameter AB in Quadrilateral divides this in two triangles, it is very easy to show that diamesus M_1M_2 form triangles AM_1M_2, BM_1M_2 equal to 180° each.

so, Any angle between the diameter AB of a circle is right angle (90°).

1. Two angles with vertices the points A, B of a diameter AB , have perpendicular sides

2. and are equal or supplementary.

3. Equal angles exist on equal arcs, and central angles are twice the inscribed angles.

4. The Sum of angles of any triangle is equal to two right angles.

i.e two Opposite angles having their sides perpendicular between them, are Equal or Supplementary between them. This property has been used in proofs of Parallel Postulate and is also a key to many others. [20]

Many theorems in classical geometry are easily proved by this simple logic.

Conclutions, and how useful is this invention is left to the reader.

5.5. A Point M on any Circle

5.5.1. A Point M on a Circle of any Diameter $AB = 0 \rightarrow \infty$

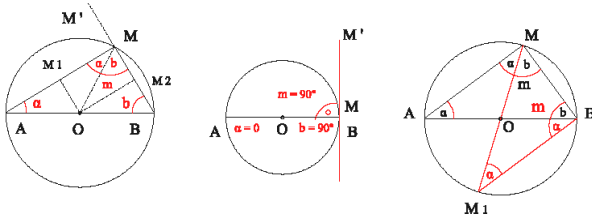


Figure 12. An angle on a circle - (5.5.1)

$AB = \text{Diameter } M \rightarrow B, AB \perp BM'$
 $\Delta [AMB = MBM1]$

Let M be any point on circle (O, $OM = OA = OB$), and M₁, M₂ the middle points of MA, MB and in second figure $MM' \perp BA$ at point B (angle $AMM' = 90^\circ$).

In third figure MM₁ is a diameter of the circle.

Show :

1. Angle $\angle AMB = MAB + MBA = a + b = m$
2. Triangles MBM₁, MBA are always equal and angle $\angle MBM1 = \angle AMB = 90^\circ$
3. The Sum of angles on triangle MAB are $\angle AMB + \angle MAB + \angle MBA = 180^\circ$.

Proof :

1. Since $OA = OM$ and $M1A = M1M$ and $OM1$ common, then triangles $OM1A$, $OM1M$ are equal and angle $\angle OAM = \angle OMA = \angle BAM = a \rightarrow$ (a) Since $OM = OB$ and $M2B = M2M$ and $OM2$ common, then triangles $OM2B$, $OM2M$ are equal and angle $\angle OBM = \angle OMB = \angle ABM = b \rightarrow$ (b) By summation (a), (b) $\angle BAM + \angle ABM = (\angle OMA + \angle OMB) = \angle AMB = a + b = m$. (c) i.e. When a Point M lies on the circle of diameter AB, then the sum of the two angles at points A, B is constantly equal to the other angle at M. Concentrated logic of geometry exists at point B, because as on segment AB of a straight line AB, which is the one dimensional Space, springs the law of Equality, the equation $AB = OA + OB$ i.e. The whole is equal to the parts, so the same is valid for angles of all points on the circumference of the circle (O,OM), [as Plane ABM and all angles there exist in the two dimensional Space], and it is $m = a + b$. In figure (11), when point M approaches to B, the Side BM' of angle $\angle ABM$ tends to the perpendicular on BA and when point M coincides with point B, then angle $\angle ABM = 90^\circ$ and $\angle OAM = \angle BAM = 0$, therefore angle $\angle AMB = 90^\circ$ and equation (c) becomes : $\angle BAM + \angle ABM = \angle AMB \rightarrow 0 + 90^\circ = \angle AMB \rightarrow \angle AMB = 90^\circ$, (i.e. $AM \perp BM$) and the sum of angles is $(\angle BAM + \angle ABM) + \angle AMB = 90^\circ + 90^\circ = 180^\circ$, or $\angle BAM + \angle ABM + \angle AMB = 180^\circ$

2. Triangles MBA, MBM₁ are equal because they have diameter $MM1 = AB$, MB common and angle $\angle OBM = \angle OMB = b$ (from isosceles triangle OMB). Since Triangles MBA, MBM₁ are equal therefore angle $\angle MM1B = \angle MAB = a$, and from the isosceles triangle OM₁B, angle $\angle OBM1 = \angle OM1B = a$ The angle at point

B is equal to $\angle MBM1 = \angle MBA + \angle ABM1 = b + a = m = \angle AMB$. Rotating diameter MM₁ through centre O so that points M, M₁ coincides with B, A then angle $\angle MBM1 = \angle MBA + \angle ABM1 = \angle BBA + \angle ABA = 90^\circ + 0 = 90^\circ$ and equal to $\angle AMB$ i.e. The required connection for angle $\angle MBM1 = \angle AMB = m = a + b = 90^\circ$. (o.e.δ)

3. Since the Sum of angles $a + b = 90^\circ$, and also $m = 90^\circ$ then $a + b + m = 90^\circ + 90^\circ = 180^\circ$. It is needed to show that angle m is always constant and equal to 90° for all points on the circle. Since angle at point B is always equal to $\angle MBM1 = \angle MBO + \angle OBM1 = b + a = m = \angle AMB$, by Rotating triangle MBM₁ so that points M, B coincide then $\angle MBM1 = \angle BBA + \angle ABA = 90^\circ + 0 = m$ Since angle $\angle AMB = a + b = m$ and is always equal to angle $\angle MBM1$, of the rotating unaltered triangle MBM₁, and since at point B angle $\angle MBM1$ of the rotating triangle MBM₁ is 90° , then is always valid, angle $\angle AMB = \angle MBM1 = 90^\circ$ (o.e.δ),

2a. To show, the Sum of angles $a + b = \text{constant} = 90^\circ = m$.

F.11 M is any point on the circle and MM₁ is the diameter. Triangles MBA, MBM₁ are equal and by rotating diameter MM₁ through centre O, the triangles remain equal.

Proof :

1. Triangles MBA, MBM₁ are equal because they have $MM1 = AB$, MB common and angle $\angle OBM = \angle OMB = b$ (from isosceles triangle OMB) so $MA = BM1$.
2. Since Triangles MBA, MBM₁ are equal therefore angle $\angle MM1B = \angle MAB = a$, and from isosceles triangle OM₁B, angle $\angle ABM1 = \angle OBM1 = \angle OM1B = a$
3. The angle at point B is always equal to $\angle MBM1 = \angle MBO + \angle OBM1 = b + a = m = \angle AMB$ Rotating triangle MBM₁ so that points M, B coincide then $\angle MBM1 = \angle BBA + \angle ABA = 90^\circ + 0 = m$. Since angle $\angle AMB = a + b = m$ and is equal to angle $\angle MBM1$, of the rotating unaltered triangle MBM₁ and which at point B has angle $m = 90^\circ$, then is valid angle $\angle AMB = \angle MBM1 = 90^\circ$ i.e. the required connection for angle $\angle AMB = m = a + b = 90^\circ$. (o.e.δ), 22 / 4 / 2010.

2b. When point M moves on the circle, Euclidean logic is as follows :

Accepting angle $\angle ABM' = b$ at point B, automatically point M is on the straight line BM' and the equation at point B is for $(a = 0, b = 90^\circ, m = 90^\circ) \rightarrow 0 + 90^\circ = m$ and also equal to, $0 + b - b + 90^\circ = m$ or the same $\rightarrow b + (90^\circ - b) = m \dots \dots (B)$

In order that point M be on the circle of diameter AB, is necessary $\rightarrow m = b + a \dots (M)$ where, a, is an angle such that straight line AM (the direction AM) cuts BM', and is $b + (90^\circ - b) = m = b + a$ or $\rightarrow 90^\circ - b = a$ and $\rightarrow a + b = 90^\circ = \text{constant}$, i.e. the demand that the two angles, a, b, satisfy equation (M) is that their sum must be constant and equal to 90° . (o.e.δ)

3. In figure 3, according to prior proof, triangles MBA, MBM₁ are equal. Triangles AM₁B, AMB are equal because AB is common, $MA = BM1$ and angle $\angle MAB = \angle ABM1$, so $AM1 = MB$. Triangles ABM₁, ABM are equal because AB is common $MB = AM1$ and $AM = BM1$ therefore angle $\angle BAM1 = \angle ABM = b$ and so, angle $\angle MAM1 =$

$$a + b = \text{MBM1}.$$

Since angle $\angle \text{AMB} = \angle \text{AM1B} = 90^\circ$ then $\text{AM} \perp \text{BM}$ and $\text{AM1} \perp \text{BM1}$.

Triangles OAM1 , OBM are equal because side $\text{OA} = \text{OB}$, $\text{OM} = \text{OM1}$ and angle $\angle \text{MOB} = \angle \text{AOM1}$, therefore segment $\text{M1A} = \text{MB}$.

Rotating diameter MM1 through O to a new position Mx , M1x any new segment is $\text{MxB} = \text{M1xA}$ and the angle $\angle \text{MxBM1x} = \text{MxBA} + \angle \text{ABM1x}$ and segment $\text{BMx} = \text{AM1x}$.

Simultaneously rotating triangle MxBM1x through B such that $\text{BMx} \perp \text{AB}$ then angle $\angle \text{MxBM1x} = \angle \text{BBA} + \angle \text{ABA} = 90^\circ + 0 = 90^\circ$, i.e. in any position Mx of point M angle $\angle \text{AMxB} = \angle \text{MxBM1x} = 90^\circ$.

i.e. two Equal or Supplementary between them opposite angles, have their sides perpendicular between them. (the opposite to that proved)

Followings the proofs, then any angle between the diameter of a circle is right angle (90°), central angles are twice the inscribed angles, angles in the same segments are equal to one another and then applying this logic on the circumscribed circle of any triangle ABM , then is proofed that the Sum of angles of any triangle is equal to two right angles or $\angle \text{BAM} + \angle \text{ABM} + \angle \text{AMB} = 180^\circ$.

5.5.2. A Point M on a Circle of Any Diameter $\text{AB} = 0 \rightarrow \infty$ F.12

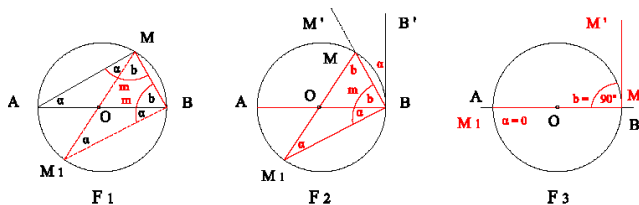


Figure 13. Any angle on a circle - (5.5.2)

To show that angle $\angle \text{AMB} = m = 90^\circ$
 $\text{BB}' \perp \text{BA}$ (angle $\angle \text{ABB}' = 90^\circ$), $\text{MM}'' \perp \text{AB}$

F.12.1 : It has been proved that triangles AMB , MBM1 are equal and angle $\angle \text{AMB} = \angle \text{MBM1} = m$ for all positions of M on the circle. Since triangles OMB , OAM1 are equal then chord $\text{BM} = \text{AM1}$ and arc $\text{BM} = \text{AM1}$.

F.12.2 : The rotation of diameter MM1 through centre O is equivalent to the new position Mx of point M and simultaneously is the rotation of angle $\angle \text{M'MxBM1} = \angle \text{M'BM1}$ through point B , and this because arc $\text{BM} = \text{AM1}$, $\text{BMx} = \text{AM1x}$, i.e. when point M moves with BMM' to a new position Mx on the circle, diameter $\text{MOM1} = \text{MxOM1x}$ is rotated through O , the points M , M1 are sliding on sides BMM' , BM1 because point M1 to the new position M1x is such that $\text{AM1x} = \text{BMx}$ and angle $\angle \text{M'BM1}$ is then rotated through B . (analytically as below)

F.12.3 : When diameter MM1 is rotated through O , point M lies on arc $\text{MB} = \text{AM1}$ and angle $\angle \text{M'BM1}$ is not altered (this again because $\text{MB} = \text{AM1}$) and when point M is at B , point M1 is at point A , because again arc $\text{BM} = \text{AM1} = 0$, and angle $\angle \text{a} = \angle \text{BM1M} = 0$, or angle $\angle \text{M1BM} = \angle \text{M1BM}' =$

$$\angle \text{ABM}' = 90^\circ = m = a + b$$

Conclusion 1.

Since angle $\angle \text{AMB}$ is always equal to $\angle \text{MBM1} = \angle \text{M'BM1}$ and angle $\angle \text{M'BM1} = 90^\circ$ therefore angle $\angle \text{AMB} = a + b = m = 90^\circ$.

Conclusion 2.

Since angle $\angle \text{ABB}' = 90^\circ = \angle \text{ABM} + \angle \text{MBB}' = b + a$, therefore angle $\angle \text{MBB}' = a$, i.e. the two angles $\angle \text{BAM}$, $\angle \text{MBB}'$ which have $\text{AM} \perp \text{BM}$ and also $\text{AB} \perp \text{BB}'$ are equal between them.

Conclusion 3.

Any angle $\angle \text{MBB}'$ on chord BM and tangent BB' of the circle (O , $\text{OA} = \text{OB}$), where is holding ($\text{BB}' \perp \text{BA}$), is equal to the inscribed one, on chord BM .

Conclusion 4.

Drawing the perpendicular MM'' on AB , then angle $\angle \text{BMM}'' = \angle \text{MAB} = \angle \text{MBB}'$, because they have their sides perpendicular between them, i.e. since the two lines BB' , MM'' are parallel and are cut by the transversal MB then the alternate interior angles $\angle \text{MBB}'$, $\angle \text{BMM}''$ are equal.

Conclusion 5.

In Mechanics, the motion of point M is equivalent to, a curved one on the circle, two Rotations through points O , B , and one rectilinear in the orthogonal system $\text{M'BM1} = \text{MBM1}$.

5.5.3. A Point M on a Circle of any Diameter $\text{AB} = 0 \rightarrow \infty$

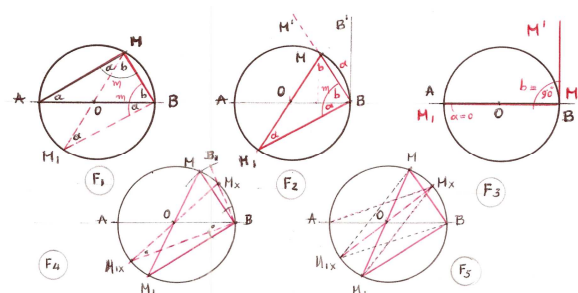


Figure 14. An angle on any circle - (5.5.3)

Show that angle $\angle \text{MBM1}$ is unaltered when plane MBM1 is rotated through B to a new position MxBM1x

Let Plane (MBM1) , (F13) be rotated through B , to a new position B1BM1x such that:

1. Line $\text{BM} \rightarrow \text{BB1}$ intersects circle (O, OB) at point Mx and the circle ($\text{B}, \text{BM} = \text{BB1}$), at point B1 .
2. Line $\text{BM1} \rightarrow \text{BM1x}$ extended intersects circle (O, OB) at the new point M1x .
3. Angle $\angle \text{M1BM1x} = \angle \text{MBB1} = \angle \text{MBMx}$, is angle of rotation.

Proof :

Since angle $\angle \text{M1BM1x} = \angle \text{MBMx}$, therefore angle $\angle \text{M1BM}$ is unaltered by rotation \rightarrow i.e. Angle $\angle \text{M1BM} = \angle \text{M1xBMx}$ and diameter MM1 is sliding uniformly on their sides.

Data + Remarks.

1. Diameter MM1 is sliding in angle $\angle \text{M1BM}$ which means that points M1 , M lie on the circle (O, OB) and on lines

BM1, BM respectively, and also sliding to the other sides BM1x, BMx of the equal angle $\angle M1xBMx$. Any line segment $M1xMw = MM1$ is also diameter of the circle.

2. Only point Mx is simultaneously on circle (O,OB) and on line BB1.
3. The circle with point M1x as centre and radius $M1xMw = MM1$ intersect circle (O, OB) at only one unique point Mw.
4. Since angle $\angle M1xBB1 = M1BM$ and since segment $M1xMw = MM1$ then chord $M1xMw$ must be also on sides of angles $M1xBB1$, $M1BM$, i.e. Point Mw must be on line BB1
5. Ascertain 2 and 4 contradict because this property belongs to point Mx, unless this unique point Mw coincides with Mx and chord $MxM1x$ is diameter of circle (O,OB).

Point Mx is simultaneously on circle (O, OB), on angle $\angle M1xBB1 = M1xBMx$ and is sliding on line BB1. We know also that the unique point Mw has the same properties as point Mx, i.e. point Mw must be also on circle (O, OB) and on line BB1, and the diameter $M1xMw$ is sliding also on sides of the equal angles $M1xBB1$, $M1xBMx$, $M1BM$.

Since point Mw is always a unique point on circle (O,OB) and also sliding on sides of angle $M1BM = M1xBMx$ and since point Mx is common to circle (O,OB) and to line BB1 = BMx, therefore, points Mw, Mx coincide and chord $MxM1x$ is diameter on the circle (O,OB), i.e. The Rotation of diameter MM1 through O, to a new position $MxM1x$, is equivalent to the Rotation of Plane (MBM1) through B and exists angle $\angle MBM1 = MxBM1x$, so angle $\angle MBM1 = MxBM1x = AMB = 90^\circ = m = a + b \dots\dots\dots \text{o.e.}\delta$

Since angle $\angle MBMx = M1BM1x$ is the angle of rotation, and since also arc $MMx = M1M1x$ (this because triangles $OMMx$, $OM1M1x$ are equal) then: Equal inscribed angles exist on equal arcs.

6. General Remarks

6.1. Axiom not Satisfied by Hyperbolic or other Geometry

It has been proved that quadrilateral $MA1CC'$ is Rectangle (F1.d) and from equality of triangles $MA1C$, $MC'C$ then angle $\angle C'MC = MCA1$. Since the sum of angles $\angle MCA1 + MCB = 180^\circ$, also, the sum of angles $\angle C'MC + MCB = 180^\circ$ which answers to Postulate P5, as this has been set (F1.e). Hyperbolic geometry, Lobachevski, non-Euclidean geometry, in Wikipedia the free encyclopedia, states that there are TWO or more lines parallel to a given line AB through a given point M not on AB. If this is true, for second angle $\angle C2MC$, exists also the sum of angles $\angle C2MC + MCB = 180^\circ$, which is Identity ($C2MC = C'MC$), i.e. all (the called parallels) lines coincide with the only one parallel line MM' , and so again the right is to Euclid geometry.

Definitions, Axioms or Postulates create a geometry, but in order this geometry to be right must follow the logic of Nature, the objective reality, which is the meter of all logics,

and has been found to be the first dimensional Unit $AB = 0 \rightarrow \infty$ (F.3-4) i.e. the reflected Model of the Universe. Lobachevski's and Riemann's Postulate may seem to be good attempts to prove Euclid's Fifth Postulate by contradiction, and recently by "compromising the opposites" "in the Smarandache geometries. Non of them contradicts any of the other Postulates of what actually are or mean. From any point M on a straight line AB, springs the logic of the equation (the whole AB is equal to the parts MA, MB as well as from two points passes only one line –theorem-), which is rightly followed (intrinsically) in Euclidean geometry only, in contradiction to the others which are based on a confused and muddled false notion (the great circle or segment is line, disk as planes and others), so all non-Euclidean geometries basically contradict to the second definition (D2) and to the first Euclidean Postulate (P 1).

6.2. Hyperbolic Geometry Satisfies the Same 4 Axioms as Euclidean Geometry, and the Error if Any in Euclidean Derivation of the 5th Axiom

An analytical trial is done to answer this question.

Postulate 1: States that "Let it have been postulated to draw a straight-line from any point to any point". As this can be done by placing the Ruler on any point A to any point B, then this is not in doubt by any geometry. The word "line" in Euclid geometry is straight line (the whole is equal to the parts, where lines on parts coincide) and axioms require that line to be as this is (Black color is Black and White color is White). For ancient Greeks $\angle \text{Ευθεία γραμμή ἐστίν, ἥτις ἐξ' ἴσου τοῖς εαυτῆς σημείοις κείται.}$ >

Postulate 2 : states that, " And to produce a finite straight-line " Marking points A, B which are a line segment AB, and by using a Ruler then can produce AB in both sides continuously, not in doubt by any geometry.

Postulate 3: states that, "And to draw a circle with any centre and radius" Placing the sting of a Compass at any point A (centre) and the edge of pencil at position B and (as in definition 15 for the circle) Radiating all equal straight lines AB, is then obtained the figure of the circle (the circumference and the inside), not in doubt by any geometry.

Postulate 4 : states that, " And all right angles are equal to one another " In definition D8 is referred as Plane Angle, to be the inclination of two lines in a plane meeting one another, and are not laid down straight-on with respect to one another, i.e. the angle at one part of a straight line. In definition D9 is stated " And when the lines containing the angle are straight then the angle is called rectilinear " and this because straight lines divide the plane, and as plane by definition is 360° then the angles on a straight line are equal to 180° In definition D10 is stated that a perpendicular straight line stood upon (another) straight-line makes adjacent angles (which are) equal to one another, each of the equal angles is a right-angle and this because as the two adjacent angles are equal and since their sum is 180° , then the two right-angles are 90° each and since this happen to any two perpendicular straight-lines, then all right angles are equal to one another, not in doubt by any geometry.

Postulate 5: This postulate is referred to the Sum of the two internal angles on the same side of a straight- line falling across two (other) straight lines, being produced to infinity, and be equal to 180° . Because this postulate, beside all attempts to prove it, was standing for centuries, mathematicians created new geometries to step aside this obstruction. In my proposed article the followings have been geometrically proved:

From any point M to any line AB (the three points consist a Plane) is constructed by using the prior four Postulates, a system of three rectangles MA1CC', C'CB1M', MA1B1M' which solve the problem. (3.d)

The Sum of angles C'MC and MCB is $< C'MC + MCB = 180^\circ$, which satisfies initial postulate P5 of Euclid geometry, and as this is now proved from the other four postulates, then it is an axiom.

The extended Structure of Euclidean-geometry to all Spaces (Spaces and Sub-spaces) resettles truth to this geometry, and by the proposed solution which is applicable to any point M, not on line AB, answers to the temporary settled age-old question for this problem.

Mathematical interpretation and all the relative Philosophical reflections based on the non-Euclid geometry theories must be properly revised and resettled in the truth one.

6.3. The sum of Angles on Any Triangle is 180°

Since the two dimensional Spaces exists on Space and Subspace (F.10) then this problem of angles must be on the boundaries of the two Spaces i.e. on the circumference of the circle and on any tangent of the circle and also to that point where Concentrated Logic of geometry exists for all units, as straight lines etc. It was proved at first that, the triangle with hypotenuse the diameter of the circle is a right angled triangle and then the triangle of the Plane of the three vertices and that of the closed area of the circle (the Subspace), measured on the circumference is 180° .

6.4. Angles with Perpendicular Sides are Equal or Supplementary

In Proofed Succession (3.3.1), is referred that two angles with perpendicular sides are equal (or supplementary). To avoid any pretext, a clear proof is given to this presupposition showing that, any angle between the diameter AB of a circle is right angle (90°).

Any two angles with vertices the points A, B of a diameter AB, have perpendicular sides and are also equal or supplementary.

Equal angles exist on equal arcs, and central angles are twice the inscribed angles.

The Sum of angles of any triangle is equal to two right angles. So, there is not any error in argument of proofs.

The 5th Postulate is Depended on (derived from) the prior four axioms.

7. Criticism to Non-Euclid Geometries

The essential difference between Euclidean and non-Euclidean geometries is the nature of parallel lines.

Euclid's fifth postulate, the parallel postulate, states that, within a two-dimensional plane ABM for a given line AB and a point M, which is not on AB .F1(3), i.e. $MA+MB > AB$, there is exactly one line through M that does not intersect AB because if $MA+MB = AB$ then point M is on line AB and then lines MA, MB coincide each one passing from two points only and thus is answered the why any line contains at least two points. In Euclid geometry, in case of two straight lines that are both perpendicular to a third line, the lines remain at a constant distance from each other and are known as parallels. Now is proved that, a point M on the Nth Space, of any first dimensional Unit $AB = 0 \rightarrow \infty$, jointly exists, with all Sub-Spaces of higher than N Spaces, and with all Spaces of lower than N Subspaces.

This is the Structure of Euclidean geometry. F2(2) As in fundamental theorem of Algebra Equations of Nth degree can be reduced to all N-a or N+a degree, by using the roots of the equations, in the same way Multi -Spaces are formed on AB. Nano-scale-Spaces, inorganic and organic, Cosmic-scale-Spaces are now unified in our world scale. Euclidean Empty Space is Homogenously Continues, but all first dimensional Unit-Spaces Heterogeneous and this because all Spaces constitute another Unit (the Nth Space Tensor is the boundaries of N points). All above referred and many others are springing from the first acceptance for point, and the approaching of Points. By multiplication is created another one very important logical notion for the laws concerning Continues or not Continues Transformations in Space and in Time for Mechanics, Physics Chemistry and motions generally. From this logic yields that a limited and not an unlimited Universe can Spring anywhere.. Since Non-existence is found everywhere then Existence is found and is Done everywhere.

If Universe follows Euclidean geometry, then this is not expanded indefinitely at escape velocity, but is moving in Changeable Spaces with all types of motions, $< \text{a twin symmetrically axial -centrifugal rotation} >$ into a Steady Space (This is System AB $\perp AB = 0 \rightarrow AB \rightarrow \infty$), with all types of curvatures. (It is a Moving and Changeable Universe into a Steady Formation) [7]. It was proved that on every point in Euclid Spaces exist infinite Impulse $P = 0 \rightarrow P \rightarrow \infty$, and so is growing the idea that Matter was never concentrated at a point and also Energy was never high $< \text{very high energy} >$ [17], i.e. Bing Bang has never been existed, but it is a Space conservation Energy State $\rightarrow W = \int A-B [P.ds] = \sum P.\delta = 0$. [21]

Gravity is particle also, in Space-Energy level which is beyond Plank's length level which needs a new type of light to see, with wave length smaller than that of our known visible light and thus can enter our wave length of light, and thus the Euclidean geometry describes this physical Space. An extend analysis in [21]. $\rightarrow [23 - 34-36]$

Hyperbolic geometry, by contrast, states that there are

infinitely many lines through M, not intersecting AB. In Hyperbolic geometry, the two lines “curve away” from each other, increasing in distance as one moves further from the points of intersection with the common perpendicular, which have been called ultra-parallel. The simplest model for Hyperbolic geometry is the pseudo-sphere of Beltrami-Klein, which is a portion of the appropriate curvature of Hyperbolic Space, and the Klein model, by contrast, calls a segment as line and the disk as Plane.??? In hyperbolic geometry the three angles of a triangle add less than 180° , without referring that triangle is not in Plane but on Sphere $<$ Spherical triangle F2(1) $>$ This omission created the wrong hyperbolic geometry. Mobius strip and Klein bottle (complete one-sided objects of three and four dimensions) transfers the parallel Postulate to a problem of one point M and a Plane, because all curves and other curve lines are not lines (For any point on a straight line exists $<$ the whole is equal to the parts which is an equality $>$ and not the inequality of the three points) because contradict to the three points only and anywhere. Einstein's theory of general relativity is bounded in deviation Planck's length level, where exists Space-time. Euclid geometry is extended to zero length level where Gravity exists as particle with wavelength near zero and infinite Energy, a different phenomenon than Space-time. In this way is proved that propositions are true only then, they follow objective logic of nature which is the meter of all logics. Answers also to those who compromise incompatibility by addition or mixture.

If our Universe follows Hyperbolic geometry then this is expanded indefinitely, which contradicts to the homogenous and isotropic Empty Spaces. [36] .

This guides to a concentrated at a point matter and Energy $<$ very high energy $>$, Bing Bang event. Elliptic geometry, by contrast, states that, all lines through point M, intersect AB. In Elliptic geometry the two lines “curve toward” each other and eventually intersect. The simplest model for Elliptic geometry is a sphere, where lines are “great circles”??? For any great circle (which is not a straight line ???) and a point M which is not on the circle all circles (not lines ???) through point M will intersect the circle. In elliptic geometry the three angles of a triangle add greater than 180° , without referring that triangle is not in Plane, but in the Sphere, $<$ in Spherical triangle F2(3) $>$. This omission created the wrong elliptic geometry. If Universe follows Elliptic geometry then this is expanded to a halt and then this will start to shrink possibly not to explode as is said, but to change the axial-centrifugal motion to the initial Rectilinear.

GR of Einstein assimilates gravity as the curvature in space-time and not as Force and this based on Elliptic geometry, by contrast, stating that, all lines through a point M and parallel to a line AB intersect line.

In Elliptic geometry the two lines “curve toward” each other and eventually intersect. The simplest model for Elliptic geometry is a sphere, where lines are “great circles”. For any great circle (which is not a straight line) and a point M which is not on the circle all circles through point M will intersect the circle. In elliptic geometry the three angles of a

triangle add greater than 180° , without referring that triangle is not in Plane, but in the Sphere (spherical triangle). *This omission created the wrong elliptic geometry and all others.*

Assuming the postulate of Relativity, $c = \text{constant}$, was valid without restrictions, this would imply that all forces of nature must be invariant under Lorentz transformations in order that principle be rigorously and universally true.

Also say that an object flying pass a massive object, the space time is curved by the massive object.

It is proved [8] that from any point, M, not on line AB can be drawn one and only one parallel to AB, which parallel doesn't intersect line. GR assimilating gravity as the curvature in space-time and not as Force and this based on Elliptic geometry, by contrast, which states that, all lines through a point M and parallel to a line AB intersect line is failing. Since also in [34-36] Gravity is force $[V_i = 2(wr)^2]$ in the Medium-Field Material-Fragment $|\pm s^2| = (wr)^2 = [MFMF]$ which is the base for all motions,

Elliptic Geometry must be properly revised.

Appealing space-time a Priori accepts the two elements, *Space and Time*, as the fundamental elements of universe without any proof for it, so anybody can say that *this stay on air*. It has been proofed [22-26] that any space AB is composed of points A,B which are nothing and equilibrium by the opposite forces $PA = - PB$ following *Principle of Virtual Displacement*. Time is the conversion factor between the conventional units (*second*) and length units (*meter*). By considering the moving monads (*particles etc. in space*) at the speed of light, pass also through Time, this is an widely agreeable illusion.

The Parallel postulate is proved to be dependent on the other four therefore is a theorem, and was one of the *unsolved from ancient times Greek problems* and because, *this age-old question was faulty considered settled with the Non-Euclidean geometries*, part of modern Physics and mathematics from Astrophysics to Quantum mechanics have been so progressively developed on these geometries, resulting to Relativity's space-time confinement and thus weak to conceive the beyond Planck's existence and explain universe.

It is a provocation to all scare today Geometers and mathematicians to give an answer to this article.

8. Conclusions

A line is not a great circle, so anything is built on this logic is a mislead false.

The fact that the sum of angles on any triangle is 180° is springing for the first time, in this article (Rational Figured numbers or Figures).

This admission of two or more than two parallel lines, instead of one of Euclid's, does not proof the truth of the admission. The same to Euclid's also, until the present proved method. Euclidean geometry does not distinguish, Space from time because time exists only in its deviation - Planck's length level-, neither Space from Energy because - Energy exists as quanta on any first dimensional Unit AB-

which connects the only two fundamental elements of Universe, that of points and that of energy. [21]

The proposed Method in this article, based on the prior four axioms only, proofs, (not using any admission but a pure geometric logic under the restrictions imposed to seek the solution) that, through point M on any Plane ABM (three points only which consist the Plane), passes only one line of which all points equidistant from AB as point M, i.e. the right is to Euclid Geometry.

Thrust of two quaternion is the, Action of quaternions $(s + \mathbf{v} \cdot \nabla i) \cdot (s + \mathbf{v} \cdot \nabla i) = [s + \mathbf{v} \cdot \nabla i]^2 = s^2 + |\mathbf{v}|^2 \cdot \nabla i^2 + 2[s \times |\mathbf{v}| \cdot \nabla i] = s^2 - |\mathbf{v}|^2 + 2[s \times |\mathbf{w}| \cdot \mathbf{r} \cdot \nabla i] \cdot \nabla i = [s^2] - [|\mathbf{v}|^2] + [2\mathbf{w} \cdot \mathbf{r} \cdot \nabla i] \cdot \nabla i$ where, $[+s^2] \rightarrow s^2 = (w.r)^2$, is the real part of the new quaternion which is, the positive Scalar product, of Space from the same scalar product, s,s with $\frac{1}{2}$, $\frac{3}{2}$, spin, and represents the, Space, part of quaternion.

$[-s^2] \rightarrow -|\mathbf{v}|^2 = -|\mathbf{w} \cdot \mathbf{r}|^2 = -[|\mathbf{w}| \cdot |\mathbf{r}|]^2 = -(w.r)^2 \rightarrow$ is the always, the negative Scalar product, of Anti-space from the dot product of, $\mathbf{w} \cdot \mathbf{r}$ vectors, with $-\frac{1}{2}$, $-\frac{3}{2}$, spin, and represents the, Anti-Space, part of quaternion.

$[\nabla i] \rightarrow 2 \cdot [s \times |\mathbf{w} \cdot \mathbf{r}| \cdot \nabla i] = 2|\mathbf{w} \cdot \mathbf{r}| \cdot (\mathbf{w} \cdot \mathbf{r}) \cdot \nabla i = 2 \cdot (w.r)^2 \rightarrow$ is a vector of, the velocity vector product, from the cross product of, $\mathbf{w} \cdot \mathbf{r}$ vectors with double angular velocity term giving 1,3,5, spin, and represents the Unification of the Space and Anti-Space through the Energy (*Work*) part of quaternion i.e.

The composition and the decomposition of monads into the two elements of nature, that of Space, Anti-space and that of energy.

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Markos Georgallides comes from Cyprus and currently resides in the city of Larnaca, after being expelled from his home town Famagusta by the Barbaric Turks in August 1974. He works as a consultant civil and architect engineer having his own business. He is also the author of numerous scholarly articles focusing on mathematical and physics related subjects. He obtained his degree from the Athens, National Polytechnic University [NATUA] and subsequently studied in Germany with specialization in constructions (WAYSS & FREYTAG – Frankfurt A.M. Neue Mainzer strasse 59 , Frankfurt) .