A phenomenon is great circle triangles

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Abstract

Great circle triangles and its related trigonometry are wider applications in astronomy, astrophysics, cosmology, engineering fields, space travel, sea voyages, electronics, architecture etc. Maxwell's electromagnetic theory showed that light is an electromagnetic wave, Dirac's equation revealed the existence and generation of anti particles and Einstein's filed equations predicted bending of light rays near a massive body, gravitational time dilation, gravitational waves , gravitational lenses, black holes, dark matter, dark energy and big bang singularity. All these findings have been experimentally established except gravitational waves. In this short work, the author finds a peculiar phenomenon in great circle triangles / Euler triangles.

Key words: Great Circle Triangles, Classical Algebra , Euclidean Geometry

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Construction

In the spherical figure NWS, NRS, NTS, NES and WRSE are all arcs of great circles. In this figure x , y, z , m , n and p respectively refer to the sum of the interior angles of triangles NRW,NRT,NETSET,SRT and SRW. Also let a ,b, f, g, i and j denote the interior angle sum of triangles NEW,SWE, NWT,NRE,SRE and SWT respectively, The lunes NWSRN, NRST and NESTN are respectively represented by c , d and e respectively.

Results

Sine the angles at NWS,WSB, SEN,ENW,NRS,NTS,WRT and RTE are straight angles, they are each is equal to 180 degrees. Let v denotes 180 degrees. (1)

Assuming (1) and adding we get the following relations:

$$x + y + z = 3v + a \qquad (2)$$

$$m + n + p = m3v + b \qquad (3)$$

$$2v + c = x + p \qquad (4)$$

$$2v + d = y + n \qquad (5)$$

$$2v + e = m + z \qquad (6)$$

$$x + y = v + f \qquad (7)$$

$$v + g = y + z \qquad (8)$$

$$z + m = 2v + h \text{ (say)} \qquad (9)$$

$$v + i = m + n \qquad (10)$$

$$p + n = v + j \qquad (11)$$

Adding (2) to (11) we get that,

$$p + c + d + e + y + g + i = a + b + f + h + j + 2v \qquad (12)$$

Putting (8) in (2) $2v + a = x + g$ (13)

$$x + p = 2v + c \qquad (4)$$

$$y + n = 2v + d \qquad (5)$$

$$m + z = 2v + e \qquad (6)$$

$3v + b = m + n + p$ (3)

$v + f = x + y$ (7)

Adding (9) and (11) $3v + h + j = m + z + p + n$ (14)

Adding the above eight equations we obtain that $y = x$ (15)

From (15) we yield that the sum of the interior angles of spherical triangles

NRW and NRT are equal. (17)

Discussion:

Let us re call that if there are two triangles with equal angles, the fifth Euclidean postulate holds.[1] It is possible to construct such that triangles NRW and NRE are congruent. Applying (17) in this relation we obtain that the interior angle sum of triangles NRT and NRE are equal. TNE and ENT. From this we get that the exterior angle NTR of triangle NTE is equal to the interior opposite angles This also proves the parallel postulate.[1-23] But the existence of consistent models of hyperbolic and elliptic non Euclidean geometries demonstrate that the fifth Euclidean postulate is a special case and does not hold in sphere. But our equations (10) to (17) are consistent. In this work, we have not introduced any new hypothesis. Our construction is mathematically acceptable. So, our finding is a peculiar phenomenon is spherical geometry. If our result is nor agreeable, then it will make a curious think on the fundamental operations of arithmetic. Further probes and studies may unlock the hidden truth. *Please note that (6) and (9) are one and the same. Since e and h are equal, e and h are added in LHS and RHS respectively in eqn.12.*

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Figure 1