A phenomenon in hyperbolic math.

Acharya Sennimalai Kalimuthu

Director, Center For Inner Studies. Rathnavel Complex , Second Floor, Near Shanthi Cinema

62, Coimbatore Road, Pollachi , Tamil Nadu n642001, India

Email : acharyasennimalaikalimuthu@yahoo.com

Abstract

The classical Euclidean geometry is widely used in all fields of science, engineering and other art fields. The hyperbolic and elliptic non Euclidean geometries are applied in theoretical physics and cosmology. In this short paper, we have come across an interesting non geometrical phenomenon.

Key words: Non – Euclidean geometries, Algebraic Application

Results

It is well known that the sum of the interior angle4s of a hyperbolic triangle is less than 180 degrees. Let us assume that y , z and m denote the interior angle sums of three en equal hyperbolic triangles.

Let the sum of the interior angles of y and z be , $y + z = 360^0 – a$ (1)

And Let the sum of the interior angles of m and z be, $m + z = 360^0 – b$ (2)

(1) – (2) gives , $y – m = b – a$ (3)

Multiplying (1) and (2), $y (m + z) + z (m + z) = 360^{02} – 360^0b – 360^0a + ab$ (4)

Multiplying (3), $b^2 + a^2 – 2ab = y^2 + m^2 – 2ym$ (5)

Adding (4) and (5) , $y [m + z - y + 2m] + z [z + m] + b [b – 2a – a + 360^0]$

$+ a [a + 360^0] = 360^{02} + m^2$

Applying (1) , (2) and (3) in the above relation,

$y [360^0 + m + a – 2b] + z [360^0 – b] + b [b – 3a + 360^0]$

$+ a [a + 360^0] = 360^{02} + m^2$

Rearranging , $m (y – m) + 360^0 (y + z + b + a - 360^0) + a (y + a – 3b) + b (b – 2y - z) = 0$

Once again putting (1) and (3) in the above equation,

$m (b - a) + 360^0 (360^0 - b + b + a - 360^0) + a (y + a – 3b) + b (b – z – 2y) = 0$

i.e $a [y + a + 360^0 - 3b - m] + b [b – z – 2y + m] = 0$

Assuming (3) in the first factor, and (1) and (3) in the second factor ,

$a [360^0 - 2b] + b [b + a – b + a – 360^0] = 0$

i.e $360^0 [a – b] – 2ab + 2ab = 0$

i.e $360^0 [a – b] = 0$

i. e $a = b$ (6)

Comparing (1) , (2) and (6) we get that $y = m$ (7)

If y and m are equal, this establishes the fifth Euclidean postulate which is

2300 years old mathematical impossibility .So, this is a contradiction. (8)

Discussion

Addition, subtraction , multiplication and division are the four fundamental operations of arithmetic. Multiplication is the shortest form for addition and division is the easiest way of subtraction. In this short work, by applying these basic operations, we have derived equations 1 to 8. Needless to say, there is no error in the algebra. So , our equations are consistent. Controversial results hide new science. Lobachevsky published his hyperbolic math.article in 1824.Mathematicians never recognized his ground breaking result. They made fun of Lobachevsky. After the publication of Einstein's special relativity theory in 1905, the basic concepts of hyperbolic math. are widely used in special relativity and the formulas of hyperbolic geometry are being applied to study the properties of atomic particles in quantum physics. So this hyperbolic revolution had to wait 81 long years for approval by the scientific community. After publishing his elliptic math. paper Riemann simply concluded: ***Here after it is up to physicists to apply my invention.*** Recalling this**,** I request the research community to probe in to this hyperbolic phenomenon.

References

[1] Smogorzhevsky, A. S. *Lobachevskian geometry*. Moscow: Mir Publishers,1976.

[2] Somerville, D. M. *Elements of non-Euclidean geometry*. New York, NY: Dover, 1958.

[3] Greenberg, Martin Jay. *Euclidean and non-Euclidean geometries: Development and history*. New Third edition. York, NY: W. H. Freeman and Co, 1993.

[4] Anderson, James W. *Hyperbolic geometry*. Second ed. New York, NY: Springer, 2005.

6] Canary, Richard, David Epstein, and Albert Marden. (Eds.) *Fundamentals of hyperbolic manifolds*. New York, NY: Cambridge University Press, 2006.

[7] Ramsay, Arlan, and Robert D. Richrmyer. *Introduction to hyperbolic geometry*. New York, NY: Springer-Verlag, 1995.

[8]Stahl, Saul. *A gateway to modern geometry: The Poincare half-plane*. Second edition. Sudbury, MA: Jones and Bartlett, 2008.