



A computer application in mathematics

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ABSTRACT

In this study, a computer application was used to solve a mathematical problem.

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1. Introduction

Geometry is the second field of mathematics. It is the extension of number theory. There is no exact period for the origin of classical geometry. Euclid was the first mathematician who compiled Elements which contains propositions and constructions. In Elements, Euclid assumed five postulates. Euclid could not prove the parallel postulate. After Euclid almost all mathematicians attempted to deduce the fifth postulate from the first four postulates. But unfortunately all of them failed. The studies on this famous historical problem gave birth to two consistent models of non-Euclidean geometries. These affine geometries are widely used in quantum physics and relativistic mechanics. Also, the surveys and research led to a number of propositions equivalent to the fifth postulate. Saccheri's similar triangle proposition is well known equivalent axiom to the parallel postulate. In this work the authors derive the preliminary result and sincerely propose the open problem by using a physical phenomena.

2. Preliminary result

In classical and Riemannian geometries we can construct similar triangles. But it is impossible to draw a triangle similar to the given triangle in Lobachevskian geometry. Let ABC be the given Lobachevskian triangle. Magnify this triangle. And let $A^0B^0C^0$ be the magnified triangle of the given Lobachevskian triangle ABC . It is well known that in magnification the angles are preserved. So, the Lobachevskian triangles ABC and $A^0B^0C^0$ are similar. Without assuming Euclid's fifth postulate, we have derived this preliminary result. This establishes Saccheri's theorem [1–4]. But it has been shown once and for all that the fifth postulate is a special case. The authors have proved this impossibility in their paper [5,6].

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3. Conclusion

Computer magnification is a Universal computer phenomenon. This technique is applied in physics, astronomy, biology, medicine, architecture, particle physics, genetics, microbiology and in chemistry. Without magnification, deep studies and research are impossible. For the first time in the history of mathematics, the authors applied magnification technology and obtained a solution for a nearly 4300 year old parallel postulate problem. In brief an impossible proposition was proved as possible. This is a problematic problem. Further studies will give birth to a new branch of mathematical science.

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References

- [1] www.groups.dcs.standac.uk/~history/HisTopics/Non.Euclidean_geometry.
- [2] www.cut-the-knot.org.
- [3] <http://www.softsurfer.com/history.html>.
- [4] www.beva.org/math323/asgn6/nov19.htm.
- [5] M. Sivasubramanian, S. Kalimuthu, On the new branch of mathematical science, *Journal of Mathematics and Statistics* 04 (2) (2008) 122–123.
- [6] M. Sivasubramanian, S. Kalimuthu, On the new branch of mathematical science Part 2, *Journal of Mathematics and Statistics* 04 (3) (2008) 146–147.