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On Imaginary Numbers

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Abstract

Number theory is the mother of all the branch of mathematics. In this study, the authors attempted to establish that $i = - i$

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Introduction

In mathematics, an imaginary number (or purely imaginary number) is a complex number whose squared value is a real number not greater than zero. The imaginary unit is denoted by i. Imaginary numbers were defined in 1572 by Rafael Bombelli. Descartes was the first to use the term "imaginary" in 1637. However, imaginary numbers were discovered earlier by Gerolamo Cardano in 1500s. But the concept of imaginary numbers were not accepted until the work of Leonhard Euler (1707-1784) and Carl Friedrich Gauss (1777-1855). In 1843, a mathematical physist W.R. Hamilton extended the idea of an axis of imaginary numbers in the plan to a three dimensional space of quaternion imaginaries.[1] and [3]. But there is an another school of thought which claim that imaginary numbers does not exist at all. It is only a mathematical fiction.[2] Going one step forward (beyond this top claim) the authors attempt to show that i =- i .

Results

Let z = a + i b be a complex number where **a** is the real part and **b** is the imaginary part of the complex number z

Now $$i\sqrt{\tilde{a}\ b} = i\ \sqrt{(\tilde{b}a)}$$

i.e., $$i\sqrt{\tilde{a}\ b} = i\ \sqrt{1}\ \ \sqrt{\tilde{b}\ a}$$

i.e., $$i\sqrt{\tilde{a}\ b} = i\ i\ \sqrt{\tilde{b}\ a}$$

i.e., $$i\sqrt{\tilde{a}\ b} = i\ i\ \sqrt{(\tilde{a}b)}$$

i.e., $$i\sqrt{\tilde{a}\ b} = i\ i\ \sqrt{1}\ \ \sqrt{\tilde{a}\ b}$$

i.e., $$i\sqrt{\tilde{a}\ b} = i\ i\ i\ \sqrt{\tilde{a}\ b}$$

i.e., $$i\sqrt{\tilde{a}\ b} = -1\ i\ \sqrt{\tilde{a}\ b}$$

i.e., $$i\sqrt{\tilde{a}\ b} = -\ i\ \sqrt{\tilde{a}\ b}$$

i.e., i = - i -----------------------(1)

Discussion

It has been accepted that zero is the only number that is both imaginary and real[1]. Similarly, i = - i. Let us recall that in geometry *–theta* denotes the vertically opposite angle. It is well known that vertically opposite angles are equal. i.e., *theta* = - *theta* . If this holds, why not i = - i ?. Since imaginary is a mathematical fiction,[2] the authors derived (1). Only further studies will unlock the hidden treasure.

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THE AUTHORS WELCOME COMMENTS

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