Composite Number Theorem*

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Abstract: An equation may be used to factor a positive composite number.

Keywords and phrases: composite number, factoring.

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1. Introduction

In November 2011, Zhikai worked out an equation he hoped may be used to factor composite numbers. It didn't turn out some easy and immediate results. Now, Zhikai is not longer in the area of mathematics, neither pure math nor computational. But Zhikai would like to practice Latex and compare it to similar products. At the same time, Zhikai is still an active mathematical thinker in computer science methodologies.

2. Composite number theorem or equation

Theorem 2.1. *Given an integer* $\mathbf{a}$*, its factors in* $(1, a)$ *can be found by solving the following equation.*

$$\sin^2(\frac{\mathbf{a}\pi}{x}) \ + \ \sin^2(\pi\ x) = 0$$

Proof. It requires that both $\sin^2(\frac{\mathbf{a}\pi}{x})$ and $\sin^2(\pi\ x)$ be zeroes. Thus both $\frac{\mathbf{a}}{x}$ and x are integers. x is the factor of a. □

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3. Discussion

Now we have a smooth function. It grants us the possibility to apply various numerical techniques to solve the equation. If the Theorem 2.1 can provide any result meaningful, we will gladly see that number theory and analysis wed again through the beautiful, curvatual π.

References