PROOF OF LEGENDRE'S CONJECTURE.

February 10,2025.

1. INTRODUCTION.

This paper tries to demonstrate that there always exitst at leats one prime número among the numbers $n^2$and $(n+1)^2$, using the Prime Number Theorem.

This theorem states that for a sufficiently large natural number $x > 0$ the number of prime numbers, is obtained from de following mathematical expression:

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$\Pi(x) \sim \frac{x}{ln(x)}$.

2. DEMONSTRATION.

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Let $\Pi\left(n^2\right) \sim \frac{n^2}{2ln(n)}$ and

Let $\Pi\left((n+1)^2\right) \sim \frac{(n+1)^2}{2ln(n+1)} \sim \frac{(n+1)^2}{2ln(n)}$

$\left(\Pi\left(n+1\right)^2 - \Pi\left(n^2\right)\right) \sim \frac{2n+1}{2ln(n)} > 1$

3. My email.

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