A Solution To The Collatz Conjecture

Preprint · March 2021

DOI: 10.13140/RG.2.2.22282.39369

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N/A
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Submitted exclusively to the London Mathematical Society
doi:10.1112/0000/000000

A Solution To The Collatz Conjecture.

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1. *The Collatz Conjecture*

The Collatz Conjecture can be stated as.

THEOREM 1.1. $f(n) = \begin{cases} \frac{n}{2}, \textit{if } n \textit{ is even} \\ 3n+1, \textit{if } n \textit{ is odd} \end{cases}$

The Collatz Conjecture has 4 permutations.
(1) $\frac{n}{2} \to 1$.
(2) $3n+1 \to \infty$.
(3) $\frac{3n+1}{2} \to ?$.
(4) $\frac{3n}{2} + 1 \to ?$.
Permutations 3 and 4 were created by applying one transformation to the other in the two possible sequences. We must now prove that for the two possible alternations that the end result will be 1. We shall do this using two separate proofs.

Proof.
(i) $\frac{3n+1}{2} = \frac{3n}{2} + 1$.

(ii) $\frac{1}{2} = 0$ or $-\frac{1}{2} = 0$.

$\sqrt{\frac{2}{2} + i\frac{2}{2}} = \sqrt{0}$.
The equations meet at the Square Root of Zero [1] and are exactly on the half-line. Therefore all permutations will reach all primes and therefore will eventually reach 1. □

References

1. Jamell Ivan Samuels. *A Proof of the Riemann Hypothesis*. ResearchGate, 2020.

2020 *Mathematics Subject Classification* 11B83 (primary),. Please refer to `http://www.ams.org/msc/` for a list of codes.