Collatz Conjecture

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March 18, 2019

Conjectures:
If n is an even integer, then the number of terms in the Collatz Conjecture sequence is less than n.

If a_n is even, then a_{n+1} is odd.
If a_n is odd, then a_{n+1} is even.

Proof: If a_n is 10, which is even, then a_{n+1} is 5, which is odd. If a_n is 5, which is odd, then a_{n+1} is 16, which is even. This pattern holds for all cases.

2^n gives n evens.
4^n gives 2n evens.
8^n gives 3n evens.
16^n gives 4n evens.

Proof: If $a_n = 2$, then the Collatz Conjecture sequence will have 1 even term. If $a_n = 4$, then the Collatz Conjecture sequence will have 2 even terms. If $a_n = 8$, then the Collatz Conjecture sequence will have 3 even terms. If $a_n = 16$, then the Collatz Conjecture sequence will have 4 even terms. This pattern holds for most cases. It does not hold for cases such as $24 = 8^3$, which gives 10 even terms, not 9, and $32 = 16^2$, which gives 5 even terms, not 8.

2^{an} yields an evens for some fixed a and some n. 2^b means there are b evens.