

Formula for π involving exponents of Mersenne primes

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Abstract: Conjectured formula for π is introduced .

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1 Conjecture

$$\pi = \frac{S_0 S_2}{M_3 M_5} \cdot \left(\prod_{\substack{p \equiv 1 \\ p \in \mathbb{M}}} \frac{p}{p-1} \right) \cdot \left(\prod_{\substack{p \equiv 3 \\ p \in \mathbb{M}}} \frac{p}{p+1} \right)$$

where $\mathbb{M} = \{p | p \in \mathbb{P} \text{ and } 2^p - 1 \in \mathbb{P}\}$, $M_3 = 2^3 - 1$, $M_5 = 2^5 - 1$, S_0 and S_2 are the first and the third term of the Lucas sequence $S_i = S_{i-1}^2 - 2$ with $S_0 = 4$. Hence $S_2 = 194$.

2 Remark

For the first 50 odd exponents of Mersenne primes I get value 3.141592655591489672... while the real value of π is 3.141592653589793238... The formula implies infinitude of even perfect numbers and therefore this is very interesting conjecture.