Michigan Math Club

Meeting virtually for the remainder of the Winter 2020 term, Thursdays at 4pm EDT ♪ ♪ ♪

This abstract contains errors

Martin J. Strauss

02 April 2020

The Liar Paradox: "This sentence is false" dates to antiquity. While four words strung together don't need to have meaning and don't need to be explained, a careful formalization is at the heart of the limitations on finding mathematical proofs, the limits of what computers can do, and a solution to a mind-body problem, in which what a computer program means or does can not be explained by what it says or is.

We'll consider related problems: the malware problem: will this putative cat video break my computer?; the song collector's problem: will this music fit in the remaining space on my device?; and the paradox of the smallest uninteresting whole number. There is a four-line proof of the impossibility of solving any of these, but the proof is hard to find and hard to wrap the mind around; you're best off enumerating all four-line proofs till you find it.

Pre-talk homework: One way to define an interesting number is an expression using four 4's and the operations +, -, *, /. What is the smallest uninteresting whole number? What if we allow also additional standard calculator operations?