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A new and improved number zero in an expanded number system

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The real numbers were built from the counting numbers in a process using new definitions and symbols to graft new numbers on to already existing numbers. The new numbers made possible something impossible with existing numbers. For example, defining fractions made possible dividing odd numbers by an even number and defining negative numbers made subtracting larger numbers from smaller numbers possible. Proposed here are new definitions and symbols to once more build on to the already existing real number system

with one key difference. An existing number, zero, will be replaced with a new and improved zero as part of the process. In this paper we will focus on the impossible task of making an additive identity that has a reciprocal - a reciprocal that is not a multiplicative inverse of zero. The benefits of defining division by the new zero such as unique quotients capable of constructing spaces of dimensions higher than the complex plane have been explored more thoroughly in another paper.

Biography

Jonathan Cender attended Harvard University several years as an undergraduate. He then worked at Stanford University in the Economics Department as a research assistant for Lawrence J. Lau, and later, Robert E. Hall. Professor Lau is currently retired from his position as Chancellor of Hong Kong University. He has studied the mathematics and philosophy of nothing intensively for a number of years.

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