

Taylor Series by Nonstandard Analysis

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Friday, February 24th, 4:00-5:00
Kalkin 002

Abstract:

In 1715, Brook Taylor discovered what is known today as the Taylor series of a function. How did he do it? His method was not the one that is found in modern calculus textbooks, but rather involved algebra with "infinite" and "infinitesimal" numbers. Such reasoning was common in the early history of calculus, but was eventually rejected as not rigorous and replaced by reasoning with limits. In the 1960s, Abraham Robinson showed how reasoning with infinite and infinitesimal numbers could be made rigorous, and used such numbers to develop an approach to calculus called nonstandard analysis. In this talk I will give a brief introduction to nonstandard analysis, and then show how the methods of nonstandard analysis can be used to justify Taylor's original reasoning.

ADA: Individuals requiring accommodations, please contact Doreen Taylor at (802) 656-3166