Michigan Math Club

WEAR A MASK

Thursday at 4pm in EH1360
Free raffle prizes afterwards!

Fractional Derivatives

$$\frac{d^{1/2}}{dx^{1/2}}[x] = ?!?$$

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After one semester of calculus, we can compute as many derivatives of a function as we want: 1st derivatives, 2nd derivatives, 100th derivatives, and so on. But is it possible to define a "-1st derivative" or a "1/2 derivative"? These "fractional derivative" operators, also called "differintegrals," do in fact exist!

In this talk, we'll introduce how to take the derivative of a function of order q, where q is an arbitrary real number, using only first-year calculus (and some help from the gamma function). We'll compute differintegrals of some basic functions, discuss their properties, observe the graphs of differintegrals, and explore one or two applications of fractional derivatives.