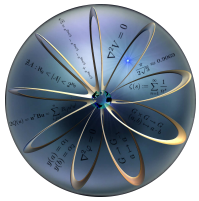

planetmath.org

Math for the people, by the people.

fractional calculus

Canonical name	FractionalCalculus
Date of creation	2013-03-22 16:18:27
Last modified on	2013-03-22 16:18:27
Owner	bchui (10427)
Last modified by	bchui (10427)
Numerical id	14
Author	bchui (10427)
Entry type	Definition
Classification	msc 28B20
Synonym	fractional calculus
Defines	fractional calculus

The idea of calculus in fractional order is nearly as old as its integer counterpart. In a letter dated September 30th 1650, l'Hôpital posed the question of the meaning of $\frac{d^\alpha f}{dx^\alpha}$ if $\alpha = \frac{1}{2}$ to Leibniz. There are different approaches to define calculus of fractional order. The following approaches are the most common and we can prove that they are equivalent

(1) Riemann-Liouville approach of fractional integration

(2) Grunwald-Letnikov approach of fractional differentiation