

Undergraduate Math Club

Fall 2006

2nd floor Nesbitt Common Room

Thursday, November 30, 4:10-5:00pm

(free pizza and pop, as always)

Tackling Takagi

(A study of the level sets of a continuous nowhere differentiable function.)

Zachary Maddock

Abstract

Defined by T. Takagi in 1903, the Takagi function, sketched to the right, is a continuous non-differentiable function on the unit interval. After defining this function, the focus of the talk will be on the countability of level sets of the Takagi function. I will spend some time on the notion of countability and exhibit Cantor's diagonalization argument. Using these elementary ideas, I will construct a dense set on the x-axis, so that each element of this set is taken to an uncountable level set. Furthermore, I will prove that, with probability one, any number randomly selected on the unit interval (via performing a sequence of infinite coin flips) will fall in this interval.

