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Chris L Rasmussen* (raz@calumet.purdue.edu), Dept. of Mathematics, 2200 169th Street, Hammond, IN 46323. *Exploring Student's Intuitions in Differential Equations.*

Grounded in evolving interests in dynamical systems and fueled by reform efforts in calculus, mathematicians are promoting new directions in differential. The purpose of this research report is to explore student's intuitive theories in the little researched domain of student learning in reform-oriented approaches to the learning and teaching of differential equations. The results of the study suggest two primary intuitive theories that influence student's reasoning in situations involving qualitative and numerical approaches. The first intuition is a theory about approximations. Based on the interview data, students appear to have an intuitive theory that approximations tend to be close to the thing being approximated. In particular, student's tended to view graphs of numerical approximations as always "looking like" the graphs of the exact solution functions, despite the fact that the slope field may indicate otherwise. The second intuition is a theory about the graphical behavior of functions. More specifically, students tended to believe that graphs of solution functions to differential equations behave in ways that are not too "strange." This intuitive theory was robust as it withstood student-generated evidence to the contrary. (Received October 03, 2000)