Undergraduate Math Club
Winter 2008
2nd floor Nesbitt Common Room
Thursday, April 10, 4:10-5:00pm
(free pizza and pop, as always)

Solving differential equations via symmetry groups

Prof. Anna Siano

Abstract

Equations of the form $dy/dx = f(x)g(y)$ are simple to solve because we can separate terms involving only x from terms involving only $y = y(x)$. In fact, the deeper property that lets us solve these is the presence of a nontrivial Lie group symmetry; i.e., a continuous family of transformations that takes each solution curve into another. We will discuss how to transform first-order ODE's into separable equations in case their sets of solution curves are invariant under some nontrivial group symmetry in some coordinates.