

# **Undergraduate Math Club**

**Winter 2008**

**2<sup>nd</sup> 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.