Mathematica provides friendly tools to solve and plot solutions to differential equations, but it is certainly not a panacea of all problems. This computer algebra system has tremendous plotting capabilities.

An ordinary differential equation (ode) is a differential equation for a function of a single variable, e.g., \( x(t) \), while a partial differential equation (pde) is a differential equation for a function of several variables, e.g., \( v(x, y, z, t) \). An ode contains ordinary derivatives and a pde contains partial derivatives. The simplest ordinary differential equations can be integrated directly by finding antiderivatives. These simplest odes have the form \( \frac{dx}{dt} \).