

Ordinary Differential Equation

An ordinary differential equation (frequently called an "ODE," "diff eq," or "diffy Q") is an equality involving a function and its **derivatives**. An ODE of order n is an equation of the form

$$F(x, y, y', \dots, y^{(n)}) = 0, \quad (1)$$

where y is a function of x , $y' = d y / d x$ is the first **derivative** with respect to x , and $y^{(n)} = d^n y / d x^n$ is the n th **derivative** with respect to x .

Nonhomogeneous ordinary differential equations can be solved if the general solution to the homogenous version is known, in which case the **undetermined coefficients method** or **variation of parameters** can be used to find the particular solution.

Many ordinary differential equations can be solved exactly in the **Wolfram Language** using `DSolve[eqn, y, x]`, and numerically using `NDSolve[eqn, y, {x, xmin, xmax}]`.

Course In Ordinary Differential Equations

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