Cheatography

Differential Equations Cheat Sheet by Algae via cheatography.com/194289/cs/40502/

Definitions

Ordinary Differ- ential Equation	Contains derivatives of one or more functions with respect to one variable
Classific- ation by Order	Highest order of derivative in equation
Solution of the Equation on Interval I	Any function defined on an interval I and possessing at least n derivatives that are continuous on I, which when substituted into an nth order differential reduces the equation to an identity
Classific- ation by linearity	F has to be linear in each of its derivatives. The power on each term of y will need to be 1.

Initial Value Problems

Consists of a differential equation and a set of conditions that should be true for a solution and its derivative. The order on the highest derivative is the amount of initial conditions needed to find an exact equation.

Examples

$$y'' - 6y' + 13y = 0; y = e^{3x} \cos 2x$$

Verify that the indicated function is a solution to the differential equation

Linearity

$$(x + y) dx + (3x2 - 1)dy = 0$$
$$(2x2 + y2) dx + (2xy) dy = 0$$

Determine whether the Differential Equation is linear or nonlinear



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