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in mathematics a differential equation is an equation that relates one or more unknown functions and their derivatives in applications the functions generally represent physical quantities the derivatives represent their rates of change and the differential equation defines a relationship between the two a differential equation is an equation involving an unknown function y f x and one or more of its derivatives a solution to a differential equation is a function y f x that satisfies the differential equation when f and its derivatives are substituted into the equation learn differential equations differential equations separable equations exact equations integrating factors and homogeneous equations and more differential equations can describe how populations change how heat moves how springs vibrate how radioactive material decays and much more they are a very natural way to describe many things in the universe differential equations are the language in which the laws of nature are expressed understanding properties of solutions of differential equations is fundamental to much of contemporary science and engineering separable equations in this section we solve separable first order differential equations i e differential equations in the form n y y m x n y y m x we will give a derivation of the solution process to this type of differential equation differential equations are equations that relate a function with one or more of its derivatives this means their solution is a function learn more in this video questions tips thanks want to join the conversation sort by top voted rappy3 10 years ago at 1 05 we see d 2 y d x 2 where is that x 2 coming from 56 votes upvote a differential equation is simply an equation that describes the derivative s of an unknown function physical principles as well as some everyday situations often describe how a quantity changes which lead to differential equations in this section we study what differential equations are how to verify their solutions some methods that are used for solving them and some examples of common and useful equations general differential equations consider the equation y 3 x 2 y 3 x 2 which is an differential equations 25 1 a differential equationis an equation for an unknown function y involving derivatives of the function for example y t y t is a differential equation for an unknown function y t we often think of t as time 25 2 unlike for usual equations like 3x 4

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