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linear equations in this section we solve linear first order differential equations i e differential equations in the form $y' + p(x)y = q(x)$

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differential equation is an equation that contains at least one derivative of an unknown function either an ordinary derivative or a partial derivative suppose the rate of change of a function y with respect to x is inversely proportional to y we express it as $\frac{dy}{dx} = k/y$

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[differential equations introduction video khan academy Apr 06 2023 web](#) the differential equation $y'' + ay' + by = 0$ is a known differential equation called second order constant coefficient linear differential equation since the derivatives are only multiplied by a constant the solution must be a function that remains almost the same under differentiation and e^x is a prime example of such a function

[2.4 solving differential equations by substitutions Dec 02 2022 web jan 23 2023](#) solution dividing by y^2 we get $y^{-2}y' + \frac{1}{x} = 0$ if we now let $u = y^{-1}$ we get $\frac{du}{dx} + 2u = \frac{1}{x}$ and substituting into $2.4.2$ we get $\frac{du}{dx} + u = \frac{1}{x}$ which is a linear equation putting it in standard linear form we get $\frac{du}{dx} + u = \frac{1}{x}$ and using the method of section 2.3 we get the solution $u = \frac{1}{x} + C e^{-x}$

[what are differential equations solving methods and examples Jul 17 2021 web](#) differential equations are also defined as the equation that contains derivatives of one or more dependent variables with respect to one or more independent variables if a function has only one independent variable then it is an ordinary differential equation examples of differential equations $\frac{d^2y}{dx^2} + 4y = 0$

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