

Unique Solution Differential Equations

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Unique Solution Differential Equations

I was wondering if it is possible that a differential equations has a solution but it is not unique. Stack Exchange Network Stack Exchange network consists of 175 Q&A communities including Stack Overflow , the largest, most trusted online community for developers to learn, share their knowledge, and build their careers.

Can a differential equation have non unique solutions ...

Knowing that a differential equation has a unique solution is sometimes more important than actually having the solution itself! Next, if the interval in the theorem is the largest possible interval on which $p(t)$ and $g(t)$ are continuous then the interval is the interval of validity for the solution.

Differential Equations - Intervals of Validity

Uniqueness and Existence for Second Order Differential Equations. $L(y) = y'' + p(t)y' + q(t)y$ the corresponding linear operator . Thus we want to find solutions to the equation $L(y) = g(t)$ $y(t_0) = y_0$ $y'(t_0) = y'_0$ We will state the following theorem without proof. The proof is well above the level of this course.

Uniqueness and Existence for Second Order Differential ...

I am a newbie to differential equations, and not sure how to approach this question: Determine a region of the xy plane for which the following differential equation: $(y-x) \cdot \frac{dy}{dx} = y + x$ would have a unique solution whose graph passes through a point (x_0, y_0) in the region.

Unique Solutions of a Differential Equation - Mathematics ...

Existence and Uniqueness of Solutions. on an interval I , then it is solution to the initial value problem Picard was among the first to look at the associated functional equation. The method he developed to find y is known as the method of successive approximations or Picard's iteration method. This is how it goes: Step 1. Consider the constant function.

Existence and Uniqueness of Solutions - S.O.S. Mathematics

In this video we present the existence and uniqueness theorem for initial value problems for ordinary differential equations.

ODE | Existence and uniqueness idea

Sufficient condition of existence and sufficient condition of existence and uniqueness of solutions of ordinary differential equations are presented in this page. Picard's iteration method is also discussed.

Existence and Uniqueness of Solutions of Ordinary ...

We have already looked at various methods to solve these sort of linear differential equations, however, we will now ask the question of whether or not solutions exist and whether or not these solutions are unique. The following theorem will provide sufficient conditions allowing the unique existence of a solution to these initial value problems.

Existence/Uniqueness of Solutions to First Order Linear ...

Existence & Uniqueness Theorem for differential equation, Part1 of Differential Equation Course: How to solve first order differential equations? The topics/...

Existence & Uniqueness Theorem, Ex1

Then there is a unique function $x \mapsto y(x)$, defined for x in $I_h(x_0)$, with continuous first derivative, such that $y'(x) = F(x, y(x))$ for all $x \in I_h(x_0)$ and such that $y(x_0) = y_0$. The theorem allows us to make predictions on the length of the interval (that is h is less than or equal to the smaller of the numbers a and b/M).

NOTES ON THE EXISTENCE AND UNIQUENESS THEOREM FOR FIRST ...

Get Started Intro to differential equations. How is a differential equation different from a regular one? Well, the solution is a function (or a class of functions), not a number. How do you like me now (that is what the differential equation would say in response to your shock)! Our mission is to provide a free, world-class education to anyone,...

Differential Equations | Khan Academy

one solution would always exist for a given initial value problem. Theorem: If the functions p and g are continuous on the interval $I: \alpha < t < \beta$ containing the point $t = t_0$, then there exists a unique function $y = \phi(t)$ that satisfies the differential equation $y' + p(t)y = g(t)$ for each t in I , and that also satisfies the initial condition $y(t_0) = y_0$, where y_0 is an arbitrary prescribed initial value.

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