

拉格朗日中值定理的推广与应用探析

摘 要: 在广义微分中值定理中, 拉格朗日中值定理是其重要组成部分, 也是研究函数的重要理论基础工具, 它不仅是罗尔中值定理的一个重要推广, 也是柯西中值定理的一个特殊表达式. 同时它是《数学分析》的重要组成部分, 对学习函数与导数关系有很大的帮助, 它对学习数学分析的相关内容起着非常重要的作用. 但《数学分析》课程中的拉格朗日中值定理仅仅介绍了定理的条件和结论, 并未对拉格朗日中值定理的实际应用算法方面的内容给予说明, 因此, 本文首先给出了拉格朗日中值定理的两种不同证明和四种推广, 并将闭区间 $[a,b]$ 推广到开区间 (a,b) 以及无限区间 $(a,+\infty)$ 、 $(-\infty,b)$ 、 $(-\infty,+\infty)$ 中. 最后总结并给出有关拉格朗日中值定理在其他题型考试方面的实际应用.

关键词: 拉格朗日中值定理; 推广; 应用

Extension and Application of Lagrange's Mean Value Theorem

Abstract: Lagrange's mean value theorem is an important part of general differential mean value theorem and an important theoretical basis tool for studying functions. It is not only an important extension of Rolle's mean value theorem, but also a special expression of Cauchy's mean value theorem. Meanwhile, as an important part of Mathematical analysis, it is of great help to learn the relationship between function and derivative, and plays a very important role in learning relevant contents of mathematical analysis. But that "mathematical analysis" course simply introduced the theorem of the Lagrange theorem of condition and conclusion, not the actual application of Lagrange theorem the content of the algorithm are given, therefore, this paper first gives the Lagrange theorem of two different certificates and four kinds of promotion, and will be closed interval $[a, b]$ are generalized to open interval (a, b) and $(a, +\infty)$, infinite interval $(-\infty, b), (a, +\infty)$. Finally, the practical application of Lagrange's mean value theorem in other questions is summarized and given.

Key words: Lagrange mean value theorem; generalization; application

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