



The Derivatives of Two Types of Functions

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Abstract

This paper takes the mathematical software Maple as the auxiliary tool to study the differential problem of two types of functions. We can obtain the Fourier series expansions of any order derivatives of these functions by using differentiation term by term theorem and Leibniz differential rule, and hence greatly reduce the difficulty of calculating their higher order derivative values. In addition, we provide two functions to evaluate their any order derivatives, and calculate some higher order derivative values practically. The research methods adopted in this study involved finding solutions through manual calculations and verifying these solutions by using Maple. This type of research method not only allows the discovery of calculation errors, but also helps modify the original directions of thinking from manual and Maple calculations. For this reason, Maple provides insights and guidance regarding problem-solving methods.

Keywords: derivatives; Fourier series expansions; differentiation term by term theorem; Leibniz differential rule; Maple

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