

## Generalizations of the Ostrowski's inequality

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### Abstract

Using the Taylor-Lagrange formula as well as a generalization of this one, we give some generalizations of the integral midpoint inequality as well of the Ostrowski inequality for  $n$ -time differentiable mappings. A new sharp generalized weighted Ostrowski type inequality is given.

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**Keywords :** *Generalized Ostrowski's inequality, generalized midpoint inequality, Taylor's formula.*

### 1. Introduction

Integral inequalities have been used extensively in most subjects involving mathematical analysis.

They are particularly useful for approximation theory and numerical analysis in which estimates of approximation errors are involved.

In 1938, Ostrowski (see for example [2], [5], [6]) proved the following integral inequality:

$$\left| f(x) - \frac{1}{b-a} \int_a^b f(t) dt \right| \leq \left[ \frac{1}{4} + \frac{(x - \frac{a+b}{2})^2}{(b-a)^2} \right] (b-a) \|f'\|_\infty, \quad (1.1)$$

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*Journal of Interdisciplinary Mathematics*

Vol. 9 (2006), No. 1, pp. 49–60

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