

LOWER BOUNDS ON A GENERALIZATION OF CESARO OPERATOR ON TIME SCALES

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Abstract. In this paper, we prove some new generalized forms of reversed dynamic inequalities of Hardy type on time scales. The main results will be established by employing the time scales Fubini theorem, reversed Hölder's inequality and a time scales chain rule.

Keywords. Time scales, Reversed Hardy inequalities.

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1 Introduction

In 1982 Lyons [5] considered the Cesaro operator

$$\frac{1}{n+1} \sum_{k=0}^n a_k,$$

where $\{a_n\}$ is a positive nonincreasing sequence and proved that

$$\sum_{n=0}^{\infty} \left(\frac{1}{n+1} \sum_{k=0}^n a_k \right)^2 \geq \frac{\pi^2}{6} \sum_{n=0}^{\infty} a_n^2. \quad (1)$$

Renaud [6] generalized the result of Lyons and proved that

$$\sum_{n=1}^{\infty} \left(\frac{1}{n+1} \sum_{k=0}^n a_k \right)^p \geq \zeta(p) \sum_{n=1}^{\infty} a_n^p, \quad (2)$$