Some Integral Inequalities of Exponential Functions via Steklov Operator

Wedad Albalawi
Department of Mathematical Sciences, College of Science, Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia

Abstract:

The core of mathematical analysis is the integral inequalities that have become important tools to analyze and solve various theorems of differential integral equations. Recently, there are many papers include integral inequalities and differential operators that have used in various applications of sciences. Hardy inequality has been one of the tools that is used to consider integrity solutions of differential equations. In this paper, we derive new formulas of Hardy and Copson inequality of the exponential functions, using Steklov operator in two cases as $0<z<(z)<(z)<\infty$, as well $0<(z)<(z)<z<\infty$. The inequalities in the new versions can be tools to solve some types of differential equations and prove the uniqueness of the solution. In addition, they have various applications, involving discontinuous domains such as bug populations, phytoremediation of metals, wound healing, maximization problems. We achieved the results with restriction on the exponents p and q of Holder's inequality. Integration by parts is the certain elementary techniques of analysis.

Keywords:

Inequalities of Hardy and Copson, Steklov operator, Holder's inequality.