D'ALEMBERT'S METHOD IN LAPLACE EQUATION

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Abstract: D'Alembert's method is typically applied to wave equation. This study extends the existing approach by examining D'Alembert's method in Laplace equation. The value of this study lies in its various explorations of the method.

Keywords and Phrases: D'Alembert's method, Laplace equation, steady-state heat equation.

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1. Introduction

This study began with the idea of exploring what would happen if D'Alembert's method, which is typically used to solve wave equations, were applied to the Laplace equation. While this method is not as general as the Fourier series approach, it is certainly elegant. Let us apply this elegant method to the Laplace equation and consider the potential issue. We believe there is a reason this has not been studied extensively until now. D'Alembert's method was originally used to find the solution to the vibrating string problem by setting

$$v = x + ct, w = x - ct,$$