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Dedication

To my Family , Teachers and Friends

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ABSTRACT

In this research we study the solution of partial differential equations using Adomian decomposition method (ADM) and modified decomposition (MD) and we compared between the results of the two methods.

In chapter one we explained the two methods and how to use them to solve initial value problem of ordinary differential equations (ODE) and gave some examples with comparison of the result founded by using ADM and MD .

In chapter two we explain how to use ADM in solving partial differential equation and we takes some example of boundary value problems, we also compare the results founded with the exact solution.

In chapter three we solve partial differential equations using MD .First we explain MD in several dimensions and we solve some example of boundary value problem we also compare the results with the solution founded by ADM and we use MD to solve Nonlinear partial differential equations.

In chapter four concentrates on results obtained by using ADM for solving some types of partial differential equations like Non linear heat equation, Fokker-Plank equation and parabolic equation and we solve heat and wave equation using MD that is the results of MD are more accurate or the same aquantitative solutions and its simple to apply.



في هذا البحث تناولنا حل المعادلات التفاضلية الجزئية باستخدام طريقتي الأدميان للتفكيك وطريقة التفكيك المعدله مع المقارنه بين نتائج الطريقتين.

في الباب الأول اوضحنا كيفية استخدام الطريقتين لحل مسائل القيم الابتدائيه للمعادلات التفاضليه العاديه وأعطينا أمثله على ذلك.

في الباب الثاني اوضحنا كيفية استخدام طريقة الأدميان للتفكيك لحل المعادلات التفاضليه الجزئيه وأخذنا حل بعض الأمثله من مسائل القيم الحديه ومقارنتها مع حلولها التحليليه.

في الباب الثالث أوضحنا كيفية حل المعادلات التفاضليه الجزئيه بطريقتة التفكيك المعدله وحل بعض من مسائل القيم الحديه ومقارنتها مع نتائج بعض المعادلات التي تم حلها بطريقتة الأدميان للتفكيك.

في الباب الرابع طبقنا طريقة الأدميان للتفكيك على بعض انواع المعادلات التفاضليه الجزئيه الخاصه مثل معادلات الحراره الغير خطيه ومعادلة فوكر- بلانك ونوع من المعادلات المكافئه ومن ثم طبقنا طريقة التفكيك المعدله لحل معادلتى الحراره والموجه فتحصلنا على حلول كميته ذات اكتر دقه من نتائج الحلول التحليليه او نفسها وإنها سهلة التطبيق.

