CHAPTER 1
INTRODUCTION

When we talk about the solutions of the differential equation , nomally we mean that such solutions should be continuous and differentiable . These kind of solutions is called the strong solution or classical solution . But in these work we are also concerned with another types of solutions which is called the weak solution, that means the solutions that belong to the space $\mathcal{D}'$ of distribution . This thesis is an extension of A.Kananthai's paper [6] . He studied the third order Euler equation of the form

$$t^3y'''(t) + t^2y''(t) + ty'(t) + my(t) = 0.$$

He obtained the weak solutions or the strong solutions depending on only the condition of m. But in this work we study the weak and strong solutions of the fourth order Euler equation of the form

$$t^4y^{(4)}(t) + t^3y'''(t) + m_2t^2y''(t) + m_1ty'(t) + m_0y(t) = 0 \tag{1}$$

which contain three costants m_0, m_1 and m_2 . The types of solution of (1) depend on the lattice plane where the relationship between m_0, m_1 and m_2 is written in the form $m_0 = am_1 + bm_2 + c$ where a, b and c are given integers .