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دراسة كيفية لحلول معادلة تفاضلية غير خطية من الرتبة الرابعة
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- Abstract** : This thesis is devoted to the study of stability, boundedness and periodicity of solutions for the non-linear differential equation of the fourth-order: $X(4) + 11(X, X, X)_X + 12(X, X) + 13(X, X) + 14(X) = p(t, x, x, x, x)$, (*). where $11, 12, 13, 14$ and p are real and continuous functions, which satisfy certain conditions. These functions are more general, than those considered by Bereketoglu in 1990. The thesis consists of four chapters. Chapter 1 contains necessary preliminaries. Chapter 2 studies the global asymptotic stability of the trivial solution of equation (*) when $p = 0$ using the method of Lyapunov function. Chapter 3 investigates the ultimate boundedness of solutions of non-autonomous: differential equation of (*), by constructing Yoshizawa function. . Finally Chapter 4 deals with the problem of the existence of periodic solutions of (*), by applying Schiiffers theorem. The above mentioned results are generalizations of the results obtained by Abou-EI-Ela and Bereketoglu in 1990
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