

Приложение к программе спецкурса «Качественная теория нелинейных дифференциальных уравнений на английском языке» («Qualitative theory of nonlinear differential equations in English»)

2015–2016

Prof. Astashova I.V.

1. Different methods to define a solution of ordinary differential equation.
2. Different theorems of existence and uniqueness for Cauchy problem to the first-order differential equations.
3. Hardy theorem on asymptotic behavior of solutions to the first-order differential equation at infinity.
4. Gronwall lemma application to estimates of solutions to nonlinear differential equations.
5. Definition of oscillatory solution on a finite and an infinite interval.
6. Kondratiev criteria of oscillation and corollaries. Kneser, Elshin and Bellman theorems.
7. Kneser theorem: sufficient oscillatory condition.
8. Sturm's theorem and comparison theorem. Estimates on distance between zeros.
9. Emden-Fowler differential equations and investigation of asymptotic behavior to solutions for different parameters of equation.
10. Application of dynamical systems for investigation of qualitative properties to nonlinear differential equations.
11. Asymptotic behavior of Kneser solutions.
12. Blow-up effect. Existence of solutions with power nonlinearity.
13. Asymptotic behavior of non-extensible solutions.
14. Oscillatory solutions of linear and nonlinear equations.
15. Kondratiev theorems on zeros of solutions to linear third- and fourth-order differential equations.
16. Kondratiev theorem on zeros of solutions to linear n -order differential equations.
17. Atkinson oscillation criterion to nonlinear second-order differential equation and its generalization.

References

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