Equations of Mathematical Physics

1. Major consepts and definitions.

2. Deduction of the String Vibration Equation.

3. Deduction of the Heat Equation .

4. Classification of the 2-nd order Linear PDE.

5. Statement of the Boundary Value problems .Correctness.The Adamar's problem.

6. The Cauchy problem.Characteristics.

7. The canonic form of the Hyperbolic type equations.

8. The canonic form of the Parabolic type equations.

9. The canonic form of the Elliptic type equations.

Hyperbolic type equations.

10. The Cauchy Problem for the String Vibration Equation. D'Alamber formula.

11. The Fourie Method of solution the 1-st Boundary (mixed) problem for String vibration Equation.

12. The Sturm –Liouville problem.

13. Justification of the Fourie method for the String vibration equation.Theorem.

14. The Fourie method of solution of the Mixed problem for the non-homogeneous String vibration equation with the non-homogeneous boundary conditions.

15. The Cauchy problem for the Wave equation in two-dimensional space. The characteristic conus.

16. The Volterra method.Poisson formula.

17. Theorem on uniqueness of solution of the Cauchy problem for the Wave equation.

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18. The Maximum principle for the Heat equation.

19. Theorem on uniqueness of solution of the Mixed problem for the Heat equation.

20. The Fourie method of solution of the Mixed problem for the Heat equation.

21. Justification of the Fourie method of solution of the Mixed problem for the Heat equation.

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23.Deduction of the Poisson formula for the Heat equation.

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25.Justification of the Poisson formula for the Heat equation.

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36.Fundamental solution of Laplace equation (n=3).

<center>Major properties of the harmonic functions in finite domain.</center>

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