

Refresher Course for College Teachers Number Theory

Topics for the course:

- Divisibility: Division algorithm, Fundamental theorem of arithmetic, Euclidean algorithm, linear Diophantine equations.
- Linear congruences: solution of linear congruence and its relation to linear Diophantine equations, system of linear congruences, Chinese remainder theorem.
- Quadratic congruences: Quadratic residues, Legendre symbol and its properties, Quadratic reciprocity law and its applications.
- Characters of finite abelian groups: Character group, Orthogonality of characters, Dirichlet characters.
- Arithmetical functions: Divisor function, Euler's totient function, Mobius inversion formula, some applications.
- Riemann zeta function: convergence, Euler product expansion, analytic continuation, Gamma function, functional equation, special values, application to prime numbers.
- Dirichlet series: convergence, Euler product, analytic continuation, functional equation, application to primes in arithmetic progressions.

1. REFERENCES

- David M. Burton, *Elementary number theory*.
- G. A. Jones and J. M. Jones, *Elementary number theory*.
- I. Niven, H. S. Zuckerman and H. L. Montgomery, *An introduction to the theory of numbers*.
- K. Ireland and M. Rosen, *A classical introduction to modern number theory*.
- T. M. Apostol, *Introduction to analytic number theory*.
- J-P. Serre, *A course in arithmetic*.

Resource Persons:

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