

The Dirichlet problem

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2 Abstract

We will introduce Fourier analysis on finite abelian groups, showing and eventually proving the main properties.

We will introduce also the zeta function and the characters showing their links to the Dirichlet problem. Then we will use this tools to prove the Dirichlet problem.

During the excursus we will also show the divergence of the sum of the reciprocal of the primes.

In this topic algebra and analysis unites in a very elegant and interesting proof of one of the basic theorem of number theory.

3 References

[1] Elias M.Stein & Rami Shakarchi, Fourier Analysis: an introduction, 2003