

# Dirichlet's Theorem on Arithmetic Progression

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P-131, Math Tower

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Last meeting, we saw there are infinitely many primes, so now we can ask the question: are there infinitely many primes in any given arithmetic progression? That is, given a sequence of the form  $l, q + l, 2q + l$  and so on, under what conditions do we still have infinitely many primes in this sequence? This very question was conjectured by Legendre, and it was Dirichlet who ultimately proved that every such sequence where  $l$  and  $q$  are co-prime has infinitely many primes, thus marking the beginning of analytic number theory. In this talk we will demonstrate how it was proved, and some other tools from analysis.