

Counting Primes, Groups and Manifolds

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Let D be a finitely generated group. Let G be a semisimple Lie group, K a maximal compact subgroup and $Y = G/K$ the associated symmetric space. Let x be a positive real number (going to infinity). We will discuss questions of the following type: How many primes are there which are less than x ? How many subgroups D has, of index at most x ? How many quotient manifolds Y has, of volume at most x ? We will show that these seemingly unrelated questions are actually connected in several different ways.

These questions lead to various problems on many different kind of groups: finite, profinite, algebraic, arithmetic and on the combinatorics of abelian groups.