

Non-abelian generalizations of the Erdos-Kac theorem

Ram Murty (murty@mast.queensu.ca)

Queen's University

Department of Mathematics and Statistics

Kingston, ON K7L 3N6

Canada

Abstract. Let a be a squarefree number greater than 1. Let $f_a(p)$ be its order modulo a prime p coprime to a . For any n coprime to a , we can define $f_a(n)$ similarly. Using the generalized Riemann hypothesis, we will establish that the normal number of prime factors of $f_a(p)$ and $f_a(n)$ has a distribution similar to the behaviour described by the celebrated Erdos-Kac theorem about the normal number of prime divisors of a natural number n . Unlike the Erdos-Kac theorem, the study of the number of prime factors of $f_a(p)$ and $f_a(n)$ involves the study of certain non-abelian extensions and an application of the Chebotarev density theorem. Our work settles a conjecture of Erdos and Pomerance formulated in 1984. (This is joint work with Filip Saidak.)

