A Simpler Classification Paradigm for Finite Simple Groups and an Application to the Riemann Hypothesis

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Abstract

In this paper we propose a new system of classification that greatly simplifies the task of classifying (or setifying) all finite simple groups (Hereafter referred to as FSGs.) We propose classification of FSGs by identifying each group with the equivalence class of certain groups up to isomorphism. Furthermore, it is shown that every FSG belongs to at least one of the equivalence classes herein.

Using our new classification, the Generalized Riemann Hypothesis is proven.

1 The classes $\aleph_1$, $\aleph_2$, ..., $\aleph_{23!}$

We define $\aleph_n$ to represent Zn for n¡23!. For n¿= 23!, $\aleph_n$ represents the point at infinity of the injective plane (see Polorovskii, Topoises 1997) and is only defined to facilitate an isomorphism used later in the paper.

Consider an arbitrary FSG A with order C. Construct an automorphism $f(x)$ of A. At random, assign to each element a number from 1 to C. Now construct a permutation $\phi(x)$ of the integers 1 to C where $\phi(x)$ is the number assigned to $f(a_x)$. We now identify each permutation of Z_C with the associated permutation of A. Clearly these two groups are isomorphic, but what does that tell us about the relation of A to Z_C? This fact demonstrates that these groups are similar in some way.

In fact, define an equivalence relation $\wp$ such that A $\wp$ B if A and B have equal cardinalities. Clearly, for any finite group A of order x ¡ 23!, A $\wp$ $\aleph_x$. If x¿= 23!, then A $\wp$ $\aleph_x$. It is now Obvious that the set of $\aleph_x$ classifies every possible group.

Now that we have classified every FSG, We may prove the Generalized Riemann Hypothesis. The equivalence between the zeroes of the Riemann zeta function and $\aleph_n$. Obviously, there are at most uncountably many nontrivial zeroes of the zeta function, yet there are only countably many $\aleph_n$, hence a contradiction. Therefore, the Riemann Hypothesis is true.

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