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by

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A LIST OF OPEN PROBLEMS FOR THE SUBGROUP COMMUTATIVITY DEGREE OF GROUPS

ENIOLA KAZEEM

Abstract. The present survey describes the state of art of the theory of the subgroup commutativity degree for finite and infinite groups. A list of open problems are extrapolated from the relevant literature and we add new ones, due to the recent approach in the infinite case.

1. Relevant Literature

P. Erdős and P. Turán [17] introduced the notion of *commutativity degree*

$$\mathrm{d}(G) = \frac{|\{(x,y) \in G \times G \mid xy = yx\}|}{|G|^2} \tag{1.1}$$

of a finite group G, in order to give a measure of the abelianess of G. In fact $\mathrm{d}(G) = 1$ if and only if G is abelian and $\mathrm{d}(G)$ can be interpreted as the probability that two randomly picked elements of G commute. It turns out that G can be classified via restrictions on $\mathrm{d}(G)$, as one can see from the main results of [3, 16, 18, 19, 20, 29, 30, 32, 39, 58, 59], but these contributions also show that generalizations are meaningful in the infinite case when compact groups are considered. Note that a parallel approach can be found by using character theory (see again [7, 28, 29, 54]).

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