On some groups of period 12

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In this talk we consider groups of period 12. In particular, we find conditions that guarantee local finiteness of such groups.

It is well-known that groups of period 4 and period 6 are locally finite [1–4]. In [1,5–7] local finiteness of groups of period 12 was proved under some additional conditions.

Our goal is to reduce a question whether a group of period 12 is locally finite to a question whether its subgroups generated by three elements of order 3 are finite. Our main result is stated in the following theorem.

Theorem. *A group of period* 12 *is locally finite if and only if every subgroup* H *of* G *is finite, given that* H *satisfies one of the following conditions.*

1. H *is generated by an element* a *of order* 3 *and elements* b *and* c *of order* 2*, such that* $(ab)^3 = (bc)^3 = 1$.

2. H *is generated by elements* a *and* b *of order* 3 *and an element* c *of order* 2*, such that* $(ac)^2 = 1$.

In particular, a group of period 12 *is locally finite if every of its subgroups generated by three elements of order* 3 *is finite.*

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