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Title: Rationality of the zeta function of the subgroups of abelian p -groups

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Given a finite abelian p -group F , we prove an efficient recursive formula for $\sigma_a(F) = \sum_{H \leq F} |H|^a$ where H ranges over the subgroups of F . We infer from this formula that the p -component of the corresponding zeta-function on groups of p -rank bounded by some constant r is rational with a simple denominator. We also provide two explicit examples in rank $r = 3$ and $r = 4$, as well as, a closed formula for $\sigma_a(F)$.

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