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Common divisors of the index and order of a modulo p

Let a be an integer different from 0 or ± 1. For primes $p \nmid a$, let $i_a(p)$ and $f_a(p)$ respectively denote the index and order of $a \bmod p$ in $(\mathbb{Z}/p\mathbb{Z})^*$. For $d \in \mathbb{N}$, we study the distribution of primes $p \leq x$ for which $d|f_a(p)$ and $d|i_a(p)$. We also give some applications of these results.