

ABSTRACT. Ailon and Rudnick have shown that if $a, b \in \mathbb{C}[T]$ are multiplicatively independent polynomials, then

$$\deg(\gcd(a^n - 1, b^n - 1))$$

is bounded for all $n \geq 1$. We show that if instead $a, b \in \mathbb{F}[T]$ for a finite field \mathbb{F} of characteristic p , then $\deg(\gcd(a^n - 1, b^n - 1))$ is larger than Cn for a constant $C = C(a, b) > 0$ and for infinitely many n , even if n is restricted in various reasonable ways (e.g., $p \nmid n$).