

49598666989151226098104244512918

MICHAEL FILASETA (University of South Carolina)

ABSTRACT: If $d_n d_{n-1} \dots d_1 d_0$ is the decimal representation of a prime, then a theorem of A. Cohn states that the polynomial $f(x) = d_n x^n + d_{n-1} x^{n-1} + \dots + d_1 x + d_0$ is irreducible over the rationals. To put this another way, if $f(x) = d_n x^n + d_{n-1} x^{n-1} + \dots + d_1 x + d_0 \in \mathbb{Z}[x]$ satisfies $0 \leq d_j \leq 9$ and $f(10)$ is prime, then $f(x)$ is irreducible. We have now shown that if N is the number in the title of the talk, then the upper bound 9 on the coefficients d_j can be replaced by N but cannot be replaced by $N + 1$. We discuss this result, various other similar results, and as time permits a little of what goes into their proofs. This is joint work of the speaker with his now former students Morgan Cole, Scott Dunn and Sam Gross.