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A criterion for polynomials to be congruent to the product of linear polynomials (mod p),

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Abstract Let $\{u_n\}$ be defined by $u_{1-m} = \cdots = u_{-1} = 0, u_0 = 1$ and $u_n + a_1u_{n-1} + \cdots + a_mu_{n-m} = 0$ ($m \geq 2, n \geq 1$). In this paper we show that the congruence $x^m + a_1x^{m-1} + \cdots + a_m \equiv 0 \pmod{p}$ has m distinct solutions if and only if $u_{p-m} \equiv \cdots \equiv u_{p-2} \equiv 0 \pmod{p}$ and $u_{p-1} \equiv 1 \pmod{p}$, where p is a prime such that $p > m$ and $p \nmid a_m$.