Kilford, L. J. P.
A generalization of a necessary and sufficient condition for primality due to Vantieghem.
(English) Zbl 1126.11307
Int. J. Math. Math. Sci. 2004, No. 69-72, 3889-3892 (2004).

The author present a family of congruences which hold if and only if a natural number \( n \) is prime. For any positive integers \( m \) and \( n \), the congruence

\[
\prod_{d=1}^{\phi(n)} (1 - m^d) \equiv n \pmod{\frac{m^n - 1}{m - 1}}
\]

is shown to hold if and only if \( n \) is prime, thus generalizing a result of E. Vantieghem [Indag. Math., New Ser. 2, No. 2, 253–255 (1991; Zbl 0734.11003)]

Reviewer: Olaf Ninnemann (Berlin)

MSC:
11A51 Factorization; primality
11A07 Congruences; primitive roots; residue systems

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