Kilford, L. J. P.
A generalization of a necessary and sufficient condition for primality due to Vantieghem.
(English) Zbl 1126.11307

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

\[
\prod_{d=1}^{\varphi(n)} (1 - m^d) \equiv n \left( \mod \frac{m^n - 1}{m - 1} \right)
\]

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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