

A new extension of the (H.2) supercongruence of Van Hamme for primes $p \equiv 3 \pmod{4}$

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Abstract

Using Andrews' multi-series generalization of Watson's ϕ_7 transformation, we give a new extension of the (H.2) supercongruence of Van Hamme for primes $p \equiv 3 \pmod{4}$, as well as its q -analogue. Meanwhile, applying the method of 'creative microscoping', recently introduced by the author and Zudilin, we establish some further q -supercongruences modulo $\Phi_n(q)^3$, where $\Phi_n(q)$ denotes the n -th cyclotomic polynomial in q .

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qH2(4k+1).pdf available at <https://authorea.com/users/312602/articles/443153-a-new-extension-of-the-h-2-supercongruence-of-van-hamme-for-primes-p-equiv-3-pmod-4>