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Congruences for Partial Sums of Reciprocals,
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Abstract

We systematically derive congruences for the sums $\sum_{j=1}^{\lfloor kp/M \rfloor} 1/j^2$ modulo p and for the sums $\sum_{j=1}^{\lfloor kp/M \rfloor} 1/j$ modulo p^2 , for all integers $M \geq 1$ that divide 24 and integers k with $1 \leq k \leq M$ and $\gcd(M, k) = 1$. While many of these congruences are well-known, others are new in the forms given. The congruences involve Fermat quotients, Euler numbers, Bernoulli polynomials, and some particular classes of generalized Bernoulli numbers belonging to quadratic characters.