Kuba, Markus; Prodinger, Helmut; Schneider, Carsten
Generalized reciprocity laws for sums of harmonic numbers. (English) [Zbl 1202.68492]
Integers 8, No. 1, Article A17, 20 p. (2008).

Summary: We present summation identities for generalized harmonic numbers $H_n^{(a)} = \sum_{k=1}^{n} \frac{1}{k^a}$, which generalize reciprocity laws discovered when studying the algorithm quickselect [P. Kirschenhofer and H. Prodinger, Comb. Probab. Comput. 7, No. 1, 111–120 (1998; Zbl 0892.68021)]. Furthermore, we demonstrate how the computer algebra package Sigma can be used in order to find/prove such identities. We also discuss alternating harmonic sums, as well as limiting relations.

MSC:
68W30 Symbolic computation and algebraic computation
33F10 Symbolic computation of special functions (Gosper and Zeilberger algorithms, etc.)
68W40 Analysis of algorithms
11B50 Sequences (mod m)

Software:
OEIS; SIGMA

Full Text: EuDML EMIS