Ramanujan's Harmonic Number Expansion into Negative Powers of a Triangular Number

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Abstract:

An algebraic transformation of the *DeTemple-Wang* half-integer approximation to the harmonic series produces the general formula and error estimate for the *Ramanujan* expansion for the *n*th harmonic number into negative powers of the *n*th triangular number. We also discuss the history of the *Ramanujan* expansion for the *n*th harmonic number as well as sharp estimates of its accuracy, with complete proofs, and we compare it with other approximative formulas.

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