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*An Evaluation of Rationally Weighted Binomial Sums Via Some Differential and Integral Operators*,  
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**Abstract**

In this paper, we use differential and integral operators, as started by Scherk in his 1823 Ph.D. thesis and rediscovered by Gauthier in 1995, to find closed forms of some rationally weighted binomial sums and several generalizations. As consequences of Gauthier's approach, we prove some identities in the literature, for example, Epsteen (1904), Finkel (1909), Greenstreet (1904), or, more recent ones (like Koshy's book from 2018). In the course of the proofs, we naturally generalize the Stirling numbers of the second kind and express some of our identities in terms of these numbers.