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*Sylvester's Theorem and the Non-Integrality of a Certain Binomial Sum*,  
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**Abstract**

In this note, we show that

$$S(n, r) := \sum_{k=0}^n \frac{k}{k+r} \binom{n}{k}$$

is not an integer for any positive integer  $n$  and  $r \in \{1, 2, 3, 4, 5, 6\}$  and for  $n \leq r - 1$ . This gives a partial answer to a conjecture of [3].