

Problem 2: A Formula from a Medieval Math Book

In *Miftāḥ Al-Ḥisab* (written in 1427), al-Kāshī gives the following rule:

If we want to add a sequence of numbers that start with something other than one and ends with any number we want, we add both ends, i.e., the smallest number and the largest number, then we multiply the sum by half the count of these numbers.

Even though algebra was established as a mathematical discipline well before the 15th century, algebraic symbolism had not still developed when the *Miftāḥ* was written. So, everything was expressed verbally. Express this rule in modern mathematical notation and prove it.

As always, show your work, fully explain and justify your answer. A solution mainly obtained by computers or calculators will not be accepted.

Posting Date 1/22/2022. Submit solutions to Noah Aydin, Mathematics Department, RBH 319 by e-mail or hard-copy by noon Saturday, Jan 29, 2022. An email submission must be a single pdf file. Hard copy submissions must be dropped in the file holder at my office door (Hayes 319) and must include a time stamp.