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19. History of Mathematics

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Summation of a sequence of natural numbers

Establishing a formula for the sum of a sequence of natural numbers whose general term is given as a polynomial of the term number is a problem which has been studied since ancient times. Zhu Shijie may be nominated as the first person who had success with this problem. In his book of 1303, he could get the formula for several cases. The general formula expressing the sum of first n terms of the p-th power of natural numbers was given by Jakob Bernoulli in 1714, and by Seki-Takakazu in 1712. In these works, properties of the table of binomial coefficients have important roles. The line of reasoning in these works will be discussed.