

On equal values of products and power sums of consecutive elements in an arithmetic progression

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Abstract. In this paper, we study the Diophantine equation

$$b^k + (a+b)^k + (2a+b)^k + \cdots + (a(x-1)+b)^k = y(y+c)(y+2c)\cdots(y+(\ell-1)c),$$

where a, b, c, k, ℓ are given integers under natural conditions. We prove some effective results for special values for c, k and ℓ , and obtain a general ineffective result based on the Bilu–Tichy method.

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