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A Galois property of even degree Bernoulli polynomials

Let k be an even integer such that k is at least 2. We give a (natural) density result to show that for almost all d at least 2, the equation $(x+1)^k + (x+2)^k + \dots + (x+d)^k = y^n$ with n at least 2, has no integer solutions (x, y, n) . The proof relies upon some Galois theory and group theory, whereby we deduce some interesting properties of the Bernoulli polynomials. This is joint work with Samir Siksek (University of Warwick).